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Frederik Pohl *GATEWAY*

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November 1976
Vol. 37, No. 8

Galaxy SCIENCE FICTION MAGAZINE



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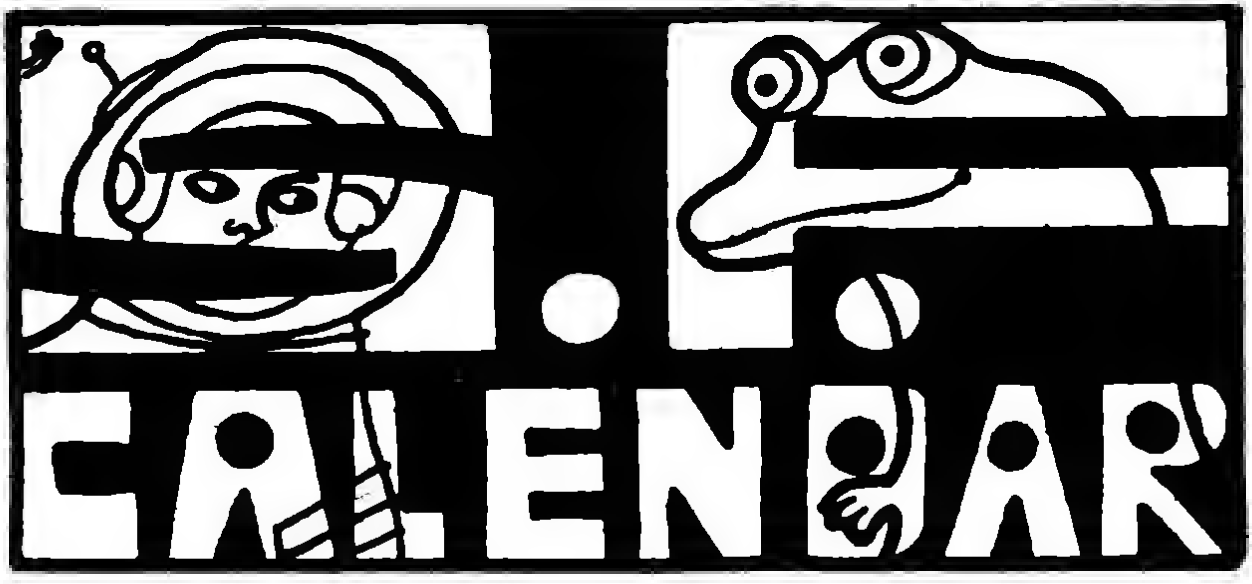
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Interior illustrations by DiFate, Fabian, Gaughan, Stembach

GALAXY, incorporating *Worlds of If*, is published monthly by UPD Publishing Corporation, a subsidiary of Universal Publishing & Distributing Corporation. Arnold E. Abramson, President. Main Offices: 235 East 45 Street, New York, N.Y. 10017. Single copy: $1.00. 12-issue subscription: $12.00 in U.S., $13.00 elsewhere.

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OCT. 29-31. ALPHA DRACONIS, Holiday Inn, downtown Toronto, Ontario, Canada. Registration: $7 until Sept. 30th, $10 after. Guests: Hal Clement, Gordon Dickson, Kelly Freas, Roy Thomas. For info: Draco Film Society, 1384 Ludbrook Ct., Mississauga, Ontario, Canada L5J 3P4.

NOV. 5-7. TUSCON IV, Sands Motor Hotel, Tucson. AZ. GoH: Ted Sturgeon. Registration: $4 until Oct. 31st, $5 after; supermembership: $10. For info: TUSCON IV, Box 49196, Tucson, AZ 85717.

JAN. 14-16, 1977. PHILCON '76, Ben. Franklin Hotel, Philadelphia, PA. Registration: $4 in advance, $5 at door. For info: Meg Phillips, 4408 Larchwood Ave., Phila. PA.

JAN 21-23. Science Fiction and Occult Fair, Statler Hilton Hotel, Downtown New York City, New York. Tickets (per day): $7.75 before Nov. 21, $8.50 before Dec. 21, $9.50 after. For free info write: TriStar, Dept. G., 521 Fifth Avenue, N.Y., N.Y. 10017.

JULY 1-4, 1977. WESTERCON 30, Totem Park Residence, University of British Columbia, Vancouver, BC, Canada. GoH: Damon Knight. Fan GoH: Frank Denton. Special guest: Kate Wilhem. Membership: $6 until July 5th. For info: WESTERCON 30, Box 48701 Sta. Bentall, Vancouver, BC, V7X 1A6.

SEPT. 1-6, 1977. SUNCON. 35th World Science Fiction Convention, Fontainbleu Hotel, Miami Beach, Fla. GoH: Jack Williamson. Fan GoH: Robert Madle. Membership: $7.50 attending, $5 supporting. For info: WORLDCON 35, Box 3427, Cherry Hill, N.J. 08002.



Frederik Pohl
GATEWAY



Gateway was Man's last hope. For those allowed to pass through its portals it was riches, fame—or death!

I

My name is Robinette Broadhead, in spite of which I am male. My analyst (whom I call Sigfrid von Shrink, although that isn't his name; he hasn't got a name, being a machine) has a lot of electronic fun with this fact:

"Why do you care if some people think it's a girl's name, Bob?"

"I don't."

"Then why do you keep bringing it up?"

He annoys me when he keeps bringing up what I keep bringing up. I look at the ceiling with its hanging mobiles and piñatas, then I look out the window. It isn't really a window. It's a moving holopic of surf coming in on Kaena Point; Sigfrid's programming is pretty eclectic. After a while I say, "I can't help what my parents called me. I tried spelling it R-O-B-I-N-E-T, but then everybody pronounces it wrong."

"You could change it to something else, you know."

"If I changed it," I say, and I am sure I am right in this, "you would just tell me I was going to obsessive lengths to defend my inner dichotomies."

"What I would tell you," Sigfrid says, in his heavy mechanical attempt at humor, "is that, please, you shouldn't use technical psychoanalytic terms. I'd appreciate it if you would just say what you feel."

"What I feel," I say, for the thousandth time, "is happy. I got no problems. Why wouldn't I feel happy?"

We play these word games a lot, and I don't like them. I think there's something wrong with his program. He says, "You tell me, Robbie. Why don't you feel happy?"

I don't say anything to that. He persists. "I think you're worried."

"Shit, Sigfrid," I say, feeling a little disgust, "you always say that. I'm not worried about anything."

He tries wheedling. "There's nothing wrong with saying how you feel."

I look out the window again, angry because I can feel myself trembling and I don't know why. "You're a pain in the ass, Sigfrid, you know that?"

He says something or other, but I am not listening. I am wondering why I waste my time coming here. If there was anybody ever who had every reason to be happy, I have to be him. I'm rich. I'm pretty good-looking. I am not too old, and anyway I have Full Medical so I can be just about any age I want to be for the next fifty years or so. I live in New York City under the Big Bubble, where you can't afford to live unless you're really well fixed, and maybe some kind of celebrity besides. I have a summer apartment that overlooks the Tappan Sea and the Palisades Dam. And the girls go crazy over my three Out bangles. You don't see too many prospectors anywhere on Earth, not even in New York. They're all wild to have me tell them what it's really like out around the Orion Nebula or the

Lesser Magellanic Cloud. (I've never been to either place, of course. The one really interesting place I've been to I don't like to talk about.)

"Or," says Sigfrid, having waited the appropriate number of microseconds for a response to whatever it was he said last, "If you really are happy, why do you come here for help?"

I hate it when he asks me the same questions I ask myself. I don't answer. I squirm around until I get comfortable again on the plastic foam mat, because I can tell that it's going to be a long, lousy session. If I knew why I needed help, why would I need help?

"Rob, you aren't very responsive today," Sigfrid says through the little loudspeaker at the head of the mat. Sometimes he uses a very lifelike dummy, sitting in an armchair, tapping a pencil and smiling quirkily at me from time to time. But I've told him that that makes me nervous. "Why don't you just tell me what you're thinking?"

"I'm not thinking about anything, particularly."

"Let your mind roam. Say whatever comes into it, Bob."

"I'm remembering—" I say, and stop.

"Remembering what, Rob?"

"Gateway?"

"That sounds more like a question than a statement."

"Maybe it is. I can't help that. That's what I'm remembering, Gateway."

I have every reason to remember Gateway. That's how I got the money and the bangles, and other things. I think back to the day I left Gateway. That was, let's see, Day 31 of Orbit 22, which means, counting back, just about sixteen years and a couple of months since I left there. I was thirty minutes out of the hospital and couldn't wait to collect my pay, catch my ship and blow.

Sigfrid says politely, "Please say what you're thinking out loud, Robbie."

"I'm thinking about Shikitei Bakin," I say.

"Yes, you've mentioned him. I remember. What about him?"

I don't answer. Old legless Shicky Bakin had the room next to mine, but I don't want to discuss it with Sigfrid. I wriggle around on my circular mat, thinking about Shicky and trying to cry.

"You seem upset, Bob."

I don't answer to that, either. Shicky was almost the only person I said good-by to on Gateway. That was funny. There was a big difference in our status. I was a prospector, and Shicky was a garbage man. They paid him enough money to cover his life-support tax because he did odd jobs and even on Gateway they have to have somebody to clean up the garbage. But sooner or later he would be too old and too sick to be any more use at all. Then, if he was lucky, they would push him out into space and he would die. If he wasn't lucky, they would send him back to Earth. He would die there, too, before very long; but first he would have the experience of living for a few weeks or so as a helpless cripple.

Anyway, he was my neighbor. Every morning he would get up and

painstakingly vacuum every square inch around his cell. It would be dirty, because there was so much trash floating around Gateway all

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481 IRRAY (o) = IRRAY ($)                                    13,320
    ,c, I think you're worried.                              13,325
482 XTERNALS ;66AA3 IF ;5B GOTO **7Z3                        13,330
    XTERNALS @Ø1R IF @7 GOTO **7Z4                           13,335
    ,S, Shit, Sigfrid, you always say that.                  13,340
    XTERNALS ¢99997AA! IF ¢8 GOTO **7Z4 IF ! GOTO            13,345
    **7Z1Ø                                                   13,350
    ,s, I'm not worried about anything.                      13,355
483 IRRAY .SHIT. .ALWAYS. .WORRIED/NOT.                      13,360
484 ,C, Why don't you tell me about it?                      13,365
485 IRRAY (P) = IRRAY (Q) INITIATE COMFORT MODE              13,370
    ,C, There's nothing wrong with saying                    13,375
    how you
    feel.                                                    13,380
487 IRRAY (Q) = IRRAY (R) GOTO **1 GOTO **2 GOTO             13,385
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489 ,S, You're a pain in the ass, Sigfrid,
    you know                                                 13,395
    that?                                                    13,400
    XTERNALS ¢1! IF ! GOTO **7Z10 IF **7Z1Ø! GOTO            13,405
    **1 GOTO **2 GOTO **3                                    13,410
    IRRAY .PAIN.                                             13,415
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the time, despite the attempts to clean it up. When he had it perfectly clean, even around the roots of the little shrublets he planted and shaped, he would take a handful of pebbles, bottle caps, bits of torn paper—the same trash he'd just vacuumed up, half the time—and painstakingly arrange it on the place he had just cleaned. Funny! I never could see the difference, but Klara said—Klara said she could.

"Bob, what were you thinking about just then?" Sigfrid asks.

I roll up into a foetal ball and mumble something.

"I couldn't understand what you just said, Robbie."

I don't say anything. I wonder what became of Shicky. I suppose he died. Suddenly I feel very sad about Shicky dying, such a very long way from Nagoya, and I wish again that I could cry. But I can't. I squirm and wriggle. I flail against the foam mat until the restraining straps squeak. Nothing helps. The pain and shame won't come out. I feel rather pleased with myself that I am trying so hard to let the feelings out, but I have to admit I am not being successful, and the dreary interview goes on:

Sigfrid says, "Bob, you're taking a long time to answer. Do you think you're holding something back?"

I say virtuously, "What kind of a question is that? If I am, how would I know?" I pause to survey the inside of my brain, looking in all the corners for padlocks that I can open for Sigfrid. I don't see any. I say judiciously, "I don't think that's it, exactly. I don't *feel* as if I were blocking. It's more as if there were so many things I wanted to say that I couldn't decide which."

"Take any one, Rob. Say the first thing that comes into your mind."

Now, that's dumb, it seems to me. How do I know which is the first thing, when they're all boiling around in there together? My father? My mother? Sylvia? Klara? Poor Shicky, trying to balance himself in flight without any legs, flapping around like a barn-swallow chasing bugs as he scoops the cobwebby scraps out of Gateway's air?

I reach down into my mind for places where I know it hurts, because it has hurt there before. The way I felt when I was seven years old, parading up and down the Rock Park walk in front of the other kids, begging that someone would pay attention to me? The way it was when we were out of realspace and knew that we were trapped, with the ghost star coming up out of nothingness below us like the smile of the Cheshire cat? Oh, I have a hundred memories like those, and they all hurt. That is, they can. They are pain. They are clearly labeled PAINFUL in the index to my memory. I know where to find them, and I know what it feels like to let them surface.

But they will not hurt unless I let them out.

"I'm waiting, Bob," Sigfrid says.

"I'm thinking," I say. As I lie there it comes to my mind that I'll be late for my guitar lesson. That reminds me of something, and I look at the fingers of my left hand, checking to see that the fingernails have not grown too long, wishing

the callouses were harder and thicker. I have not learned to play the guitar very well, but most people are not that critical and it gives me pleasure. Only you have to keep practicing and remembering. Let's see, I think, how do you make that transition from the D-maj to the C-7th again?

"Bob," Sigfrid says, "this has not been a very productive session. There are only about ten or fifteen minutes left. Why don't you just say the first thing that comes into your mind . . . *now*."

I reject the first thing and say the second. "The first thing that comes into my mind is the way my mother was crying when my father was killed."

"I don't think that was actually the first thing, Bob. Let me make a guess. Was the first thing something about Klara?"

My chest fills, tingling. My breath catches. All of a sudden there's Klara rising up before me, sixteen years before and not yet an hour older. . . . I say, "As a matter of fact, Sigfrid, I think what I want to talk about is my mother." I allow myself a polite, deprecatory chuckle.

Sigfrid doesn't ever sigh in resignation, but he can be silent in a way that sounds about the same.

"You see," I go on, carefully outlining all the relevant issues, "she wanted to get married again after my father died. Not right away. I don't mean that she was glad about his death, or anything like that. No, she loved him all right. But still, I see now, she was a healthy young woman—well, fairly young. Let's see, I suppose she was about thirty-three. And if it hadn't been for me I'm sure she would have remarried. I have feelings of guilt about that. I kept her from doing it. I went to her and said, 'Ma, you don't need another man. I'll be the man in the family. I'll take care of you.' Only I couldn't, of course. I was only about five years old."

"I think you were nine, Robbie."

"Was I? Let me think. Gee, Sigfrid, I guess you're right—" And then I try to swallow a big drop of spit that has somehow instantly formed in my throat and I gag and cough.

"Say it, Rob!" Sigfrid insistently. "What do you want to say?"

"God damn you, Sigfrid!"

"Go ahead, Rob. Say it."

"Say what? Christ, Sigfrid! You're driving me right up the wall! This shit isn't doing either one of us any good!"

"Say what's bothering you, Bob, please."

"Shut your fucking tin mouth!" All that carefully covered pain is pushing its way out and I can't stand it, can't deal with it—

"I suggest, Bob, that you try—"

I surge against the straps, kicking chunks out of the foam matting, roaring, "Shut up, you! I don't want to hear. I can't cope with this, don't you understand me? I can't! Can't cope, can't cope!"

Sigfrid waits patiently for me to stop weeping, which happens rather suddenly. And then, before he can say anything, I say wearily, "Oh, hell, Sigfrid, this whole thing isn't getting us anywhere. I think we

should call it off. There must be other people who need your services more than I do."

"As to that, Rob," he says, "I am quite competent to meet all the demands on my time."

I am drying my tears on the paper towels he has left beside the mat and don't answer.

"There is still excess capacity, in fact," he goes on. "But you must be the judge of whether we continue with these sessions or not."

"Say, Sigfrid, have you got anything to drink in the recovery room?" I ask.

"Not in the sense you mean, no. There is what I am told is a very pleasant bar on the top floor of this building."

"Well," I say, "I just wonder what I'm doing here."

And, fifteen minutes later, having confirmed my appointment for the next week, I am drinking a cup of tea in Sigfrid's recovery cubicle. I listen to hear if his next patient has started screaming yet, but I can't hear anything.

So I wash my face, adjust my scarf and slick down the little cowlick in my hair. I go up to the bar for a quick one. The headwaiter, who is human, knows me, and gives me a seat looking south toward the Lower Bay rim of the bubble. He looks toward a tall copper-skinned girl with green eyes sitting by herself, but I shake my head.

I drink one short drink, admire the legs on the copper-skinned girl and, thinking mostly about where I am going to go for dinner, leave to keep my appointment for my guitar lesson.

II

All my life I wanted to be a prospector, as far back as I can remember. I couldn't have been more than six when my father and mother took me to a fair in Cheyenne. Hot dogs and popped soya, colored paper hydrogen balloons, a circus with dogs and horses, wheels of fortune, games, rides. And there was a pressure tent with opaque sides, a dollar to get in, and inside somebody had arranged a display of imports from the Heechee tunnels on Venus. Prayer fans and fire pearls, real Heechee-metal mirrors that you could buy for twenty-five dollars apiece. Pa said they weren't real, but to me they were real. We couldn't afford twenty-five dollars apiece, though. And when you came right down to it, I didn't really need a mirror. Freckled face, buck teeth, hair I brushed straight back and tied. They had just found Gateway. I heard my father talking about it that night in the airbus, going home, when I guess they thought I was asleep, but the wistful hunger in his voice had kept me awake.

If it hadn't been for my mother and me he might have found a way to go. But he never got the chance. He was dead a year later. All I inherited from him was his job, as soon as I was big enough to hold it.

I don't know if you've ever worked in the food mines, but you've probably heard about them. There isn't any great joy there. I started, half time and half pay, at twelve. By the time I was sixteen I had my father's rating: charge driller—good pay, hard work.

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But what can you do with the pay? It isn't enough for Full Medical. It isn't enough even to get you out of the mines, only enough to be a sort of local success story. You work six hours on and ten hours off. Eight hours sleep and you're on again, with your clothes stinking of shale all the time. You can't smoke, except in sealed rooms. The oil fog settles everywhere. The girls are as smelly and slick and frazzled as you are.

So we all did the same things, we worked and chased each other's women and played the lottery. And we drank a lot, the cheap, powerful liquor that was made not ten miles away. Sometimes it was labeled Scotch and sometimes Vodka or Bourbon, but it all came off the same slime-still columns. I was no different from any of the others . . . except that, one time, I won the lottery. And that was my ticket out.

Before that happened I just lived.

My mother was a miner, too. After my father was killed in the shaft fire she brought me up, with the help of the company creche. We got along all right until I had my psychotic episode. I was twenty-six at the time. I had some trouble with my girl, and then for a while I just couldn't get out of bed in the morning. So they put me away. I was out of circulation for most of a year, and when they let me out of the shrink tank my mother had died.

Face it: that was my fault. I don't mean I planned it, I mean she would have lived if she hadn't had me to worry about. There wasn't enough money to pay the medical expenses for both of us. I needed psychotherapy. She needed a new lung. She didn't get it, so she died.

I hated living on in the same apartment after she was dead, but it was either that or go into bachelor quarters. I didn't like the idea of living in such close proximity to a lot of men. Of course I could have got married. I didn't—Sylvia, the girl I'd had the trouble with, was long gone by that time—but it wasn't because I had anything against the idea of marriage. Maybe you might think I did, considering my psychiatric history, and also considering that I'd lived with my mother as long as she was alive. But it isn't true. I liked girls very much. I would have been very happy to marry one and raise a child.

But not in the mines.

I didn't want to leave a son of

mine the way my father had left me.

Charge drilling is bitchy hard work. Now they use steam torches with Heechee heating coils and the shale just politely splits away, like carving cubes of wax. But then we drilled and blasted. You'd go down into the shaft at the start of your shift on the high-speed drop. The shaft wall was slimy and stinking ten inches from your shoulder, moving at sixty kilometers an hour relative to you; I've seen miners with a few drinks in them stagger and stretch out a hand to support themselves and pull back a stump. Then you pile out of the bucket and slip and stumble on the duckboards for a kilometer or more till you come to the working face. You drill your shaft. You set your charges. Then you back out into a cul-de-sac while they blast, hoping you figured it right and the whole reeking, oily mass doesn't come down on you. (If you're buried alive you can live up to a week in the loose shale. People have. Usually when they don't get rescued until after the third day they're never any good for anything any more.) Then, if everything has gone all right, you dodge the handling loaders as they come creeping in on their tracks, on your way to the next face.

The masks, they say, take out most of the hydrocarbons and the rock dust. They don't take out the stink. I'm not sure they take out all the hydrocarbons, either. My mother is not the only miner I knew who needed a new lung—nor the only one who couldn't pay for one, either.

And then, when your shift is over, where is there to go?

You go to a bar. You go to a dorm-room with a girl. You go to a recroom to play cards. You watch TV.

You don't go out doors very much. There's no reason. There are a couple of little parks, carefully tended, planted, replanted; Rock Park even has hedges and a lawn. I bet you never saw a lawn that had to be washed, scrubbed (with detergent!) and air-dried every week, or it would die. So we mostly leave the parks to the kids.

Apart from the parks, there is only the surface of Wyoming, and as far as you can see it looks like the surface of the Moon. Nothing green anywhere. Nothing alive. No birds, no squirrels, no pets. A few sludgy, squdgy creeks that for some reason are always bright ochre-red under the oil. They told us that we were lucky at that, because our part of Wyoming was shaft-mining. In Colorado, where they strip-mined, things were even worse.

I always found that hard to believe, and still do, but I've never gone to look.

And apart from everything else, there's the smell and sight and sound of the work. The sunsets orangey-brown through the haze. The constant smell. All day and all night there's the roar of the extractor furnaces, heating and grinding the marlstone to get the kerogen out of it, and the rumble of the long-line conveyors, dragging the spent shale away to pile it somewhere.

See, you have to heat the rock to extract the oil. When you heat it it expands, like popcorn. So there's no place to put it. You can't

squeeze it back into the shaft you've taken it out of; there's too much of it. If you dig out a mountain of shale and extract the oil, the popped shale that's left is enough to make two mountains. So that's what you do. You build mountains.

And the runoff heat from the extractors warms the culture sheds, and the oil grows its slime as it trickles through the shed, and the slime-skimmers scoop it off and dry it and press it . . . and we eat it, or some of it, for breakfast the next morning.

Funny. In the old days oil used to bubble right out of the ground! And all people thought to do with it was stick it in their automobiles and burn it up.

All the TV shows have morale-builder commercials telling us how important our work is, how the whole world depends on us for food. It's all true. They don't have to keep reminding us. If we didn't do what we do there would be hunger in Texas and kwashiorkor among the babies in Oregon. We all know that. We contribute five *trillion* calories a day to the world's diet, half the protein ration for about a fifth of the global population. It all comes out of the yeasts and bacteria we grow off the Wyoming shale oil, along with parts of Utah and Colorado. The world needs that food. But so far it has cost us most of Wyoming, half of Appalachia, a big chunk of the Athabasca tar sands region . . . and what are we going to do with all those people when the last drop of hydrocarbon is converted to yeast?

It's not my problem, but I still think of it.

It stopped being my problem when I won the lottery, the day after Christmas, the year I turned twenty-six.

The prize was two hundred and fifty thousand dollars. Enough to live like a king for a year. Enough to marry and keep a family on, provided we both worked and didn't live too high.

Or enough for a one-way ticket to Gateway.

I took the lottery ticket down to the travel office and turned it in for passage. They were glad to see me; they didn't do much of a business there, especially in that kind of commodity. I had about ten thousand dollars left over in change, give or take a little. I didn't count it. I bought drinks for my whole shift as far as it would go. With the fifty people in my shift, and all the friends and casual drop-ins who leeched on to the party, it went about twenty-four hours.

Then I staggered through a Wyoming blizzard back to the travel office. Five months later, I was circling in toward the asteroid, staring out the portholes at the Brazilian cruiser that was challenging us, on my way to being a prospector at last.

III

Sigfrid never closes off a subject. He never says, "Well, Bob, I guess we've talked enough about that." But sometimes when I've been lying there on the mat for a long time, not responding much, making jokes or humming through my nose, after a while he'll say:

"I think we might go back to a

different area, Bob. There was something you said some time ago that we might follow up. Can you remember that time, the last time you—"

"The last time I talked to Klara, right?"

"Yes, Bob."

"Sigfrid, I always know what you're going to say."

"Doesn't matter if you do, Bob. What about it? Do you want to talk about how you felt that time?"

"Why not?" I clean the nail of my right middle finger by drawing it between my two lower front teeth. I inspect it and say, "I realize that was an important time. Maybe it was the worst moment of my life, about. Even worse than when Sylvia ditched me, or when I found out my mother died."

"Are you saying you'd rather talk about one of those things, Rob?"

"Not at all. You say talk about Klara, we'll talk about Klara."

And I settle myself on the foam mat and think for a while. I've been very interested in transcendental insight and sometimes when I set a problem to my mind and just start saying my mantra over and over I come out of it with the problem solved: Sell the fish-farm stock in Baja and buy plumbing supplies on the commodities exchange. That was one, and it really paid out. Or: Take Rachel to Merida for water-skiing on the Bay of Campeche. That got her into my bed the first time, when I'd tried everything else.

And then Sigfrid says:

"You're not responding, Rob."

"I'm thinking about it."

"Please don't think about it, Rob. Just talk. Tell me what you're feeling about Klara right now."

I try to think it out honestly. Sigfrid won't let me get into TI for it, so I look inside my mind for suppressed feelings.

"Well, not much," I say. Not much on the surface, anyway.

"Do you remember the feeling at the time, Bob?"

"Of course I do."

"Try to feel what you felt then, Bob."

"All right." Obediently I reconstruct the situation in my mind. There I am, talking to Klara on the radio. Dane is shouting something in the lander. We're all frightened out of our wits. Down underneath us the blue mist is opening up, and I see the dim skeletal star for the first time. The Three-ship . . . no, it was a Five . . . anyway, it stinks of vomit and perspiration. My body aches.

I can remember it exactly, although I would be lying if I said I was letting myself feel it.

I say lightly, half chuckling, "Sigfrid, there's an intensity of pain and guilt and misery there that I just can't handle." Sometimes I try that with him, saying a kind of painful truth in the tone you might use to ask the waiter at a cocktail party to bring you another rum punch. I do that when I want to divert his attack. I don't think it works. Sigfrid has a lot of Heechee circuits in him. He's a lot better than the machines at the Institute were, when I had my episode. He continuously monitors all my physical parameters: skin conductivity and pulse and beta-wave activity

and so on. He gets readings from the restraining straps that hold me on the mat, to show how violently I fling myself around. He meters the volume of my voice and spectrum-scans the print for overtones. And he also understands what the words mean. Sigfrid is extremely smart, considering how stupid he is.

It is very hard, sometimes, to fool him. I get to the end of a session absolutely limp, with the feeling that if I had stayed with him for one more minute I would have found myself falling right down into that pain and it would have destroyed me.

Or cured me. Perhaps they are the same thing.

IV

So there was Gateway, getting bigger and bigger in the ports of the ship up from Earth:

An asteroid. Or perhaps the nu-

```
322 ,S, I don't know why I keep coming back
    to you,                                    17,095
    Sigfrid.                                   17,100
323 IRRAY .WHY.                                17,105
324 ,C, I remind you, Robby, you've already
    used up                                    17,110
    three stomachs and, let me see,
    nearly five meters                         17,115
    of intestine.                              17,120
325 ,C, Ulcers, cancer.                        17,125
326 ,C, Something appears to be eating
    away at you,                               17,130
    Bob.                                       17,135
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cleus of a comet. About ten kilometers through the longest way. Pear-shaped. On the outside it looks like a lumpy charred blob with glints of blue. On the inside it's the gateway to the universe.

Sheri Loffat leaned against my shoulder, with the rest of our bunch of would-be prospectors clustered behind us, staring. "Jesus, Bob. Look at the cruisers!"

"They find anything wrong," said somebody behind us, "and they blow us out of space."

"They won't find anything wrong." said Sheri, but her remark ended with a question mark. Those cruisers looked mean, circling jealously around the asteroid, watching to see that whoever comes in isn't going to steal the secrets that are worth more than anyone can ever pay.

We hung to the porthole braces to rubberneck at them. Foolishness, that was. We could have been killed. There wasn't really much likelihood that our ship's matching orbit with Gateway or the Brazilian cruiser would take much delta-V, but there only had to be one quick course correction to spatter us. And there was always the other chance, that our ship would rotate a quarter-turn or so and we'd suddenly find ourselves staring into the naked, nearby sun. That meant blindness for always, that close. But we wanted to see.

The Brazilian cruiser didn't bother to lock on. We saw flashes back and forth, and knew that they were checking our manifests by laser. That was normal. I said the cruisers were watching for thieves, but actually they were more to watch each other than to worry about anybody else. Including us. The Russians were suspicious of the Chinese, the Chinese were suspicious of the Russians, the Brazilians were suspicious of the Venusians. They were all suspicious of the Americans.

So the other four cruisers were surely watching the Brazilians more closely than they were watching us. But we all knew that if our coded navicerts had not matched the patterns their five separate consulates at the departure port on Earth had filed, the next step would not have been an argument. It would have been a torpedo.

It's funny. I could imagine that torpedo. I could imagine the cold-eyed warrior that would aim and launch it, and how our ship would blossom into a flare of orange light and we would all become dissociated atoms in orbit. . . . Only the torpedoman on that ship, I'm pretty sure, was at that time an armorer's mate named Francy Hereiro. We got to be pretty good buddies later on. He wasn't what you'd really call a cold-eyed killer. I cried in his arms all the day after I got back from that last trip, in my hospital room, when he was supposed to be searching me for contraband. And Francy cried with me.

The cruiser moved away and we all surged gently out, then pulled ourselves back to the window with the grips, as our ship began to close in on Gateway.

"Looks like a case of smallpox," said somebody in the group.

It did; and some of the pockmarks were open. Those were the berths for ships that were out on

(Transcript of Q. & A., Professor Hegramet's lecture.)

Q. What did the Heechee look like?

Professor Hegramet: Nobody knows. We've never found anything resembling a photograph, or a drawing, except for two or three maps. Or a book.

Q. Didn't they have some system of storing knowledge, like writing?

Professor Hegramet: Well, of course they must have. But what it is, I don't know. I have a suspicion. . .well, it's only a guess.

Q. What?

Professor Hegramet: Well, think about our own storage methods and how they would have been received in pre-technological times. If we'd given, say, Euclid a book, he could have figured out what it was, even if he couldn't understand what it was saying. But what if we'd given him a tape cassette? He wouldn't have known what to do with it. I have a suspicion, no, a conviction, that we have some Heechee "books" we just don't recognize. A bar of Heechee metal. Maybe that Q-spiral in the ships, the function of which we don't know at all. This isn't a new idea. They've all been tested for magnetic codes, for microgrooves, for chemical patterns—nothing has shown up. But we may not have the instrument we need to detect the messages. Euclid couldn't have tested a tape for magnetic information storage without something that could detect the magnetism—say, a very sensitive compass needle. He didn't have anything like that. There was no way for him to know that there was a message on the tape. We're in the same position with the Heechee.

Q. There's something about the Heechee that I just don't understand. Why did they leave all these tunnels and places? Where did they go?

Professor Hegramet: Young lady, it beats the piss out of me.

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mission. Some of them would stay open forever, because the ships wouldn't be coming back. But most of the pocks were covered with bulges that looked like mushroom caps.

Those caps were the ships themselves, what Gateway was all about.

The ships weren't easy to see. Neither was Gateway itself. It had a low albedo to begin with, and it wasn't very big: as I say, about ten kilometers on the long axis, half that through its equator of rotation. But it could have been detected. After that first tunnel rat led them to it, astronomers began asking each other why it hadn't been spotted a century earlier. Now that they know where to look, they find it. It sometimes gets as bright as seventeenth magnitude, as seen from Earth.

That's easy. You would have thought it would have been picked up in a routine mapping program.

The thing is, there weren't that many routine mapping programs in that direction, and it seems Gateway wasn't where they were looking when they looked.

Stellar astronomy usually pointed away from the sun. Solar astronomy usually stayed in the plane of the ecliptic—and Gateway has a right-angle orbit. So it fell through the cracks.

The piezophone clucked and said, "Docking in five minutes. Return to your bunks. Fasten webbing."

We were almost there.

* * *

Sheri Loffat reached out and held my hand through the webbing. I squeezed back. We had never been to bed together, never met until she turned up in the bunk next to mine on the ship, but the vibrations were practically sexual. As though we were about to make it in the biggest, best way there ever could be; but it wasn't sex, it was Gateway.

When men began to poke around the surface of Venus they found the Heechee diggings.

They didn't find any Heechees. Whoever the Heechees were, whenever they had been on Venus, they were gone. Not even a body was left in a burial pit to exhume and cut apart. All there was was the tunnels, the caverns, the few piddling little artifacts, the technological wonders that human beings puzzled over and tried to reconstruct.

Then somebody found a Heechee map of the solar system. Jupiter



was there with its moons, and Mars, and the outer planets, and the Earth-Moon pair. And Venus, which was marked in black on the shining blue surface of the Heechee-metal map. And Mercury, and one other thing, the only other thing marked in black besides Venus: An orbital body that came inside the perihelion of Mercury and outside the orbit of Venus, tipped ninety degrees out of the plane of the ecliptic so that it never came very close to either. A body which had never been identified by terrestrial astronomers. Conjecture: an asteroid, or a comet—the difference is only semantic—which the Heechee had cared about specially for some reason.

Probably sooner or later a telescopic probe would have followed up that clue, but it wasn't necessary. Then The Famous Sylvester Macklin—who wasn't up to that point the famous anything, just another tunnel rat on Venus—found a Heechee ship and got himself to Gateway, and died there. But he managed to let people know where he was by cleverly blowing up his ship. So a NASA probe was diverted from the chromosphere of the sun, and Gateway was reached and opened up by man.

Inside were the stars.

Inside, to be less poetic and more literal, were nearly a thousand smallish spacecraft, shaped something like fat mushrooms. They came in several shapes and sizes. The littlest ones were button-topped, like the mushrooms they grow in the Wyoming tunnels after they've dug all the shale out, and you buy in the supermarket. The bigger ones were pointy, like morels. Inside the caps of the mushrooms were living quarters and a power source that no one understood. The stems were chemical rocket ships, kind of like the old Moon Landers of the first space programs.

No one had ever figured out how the caps were driven, or how to direct them.

That was one of the things that made us all nervous: the fact that we were going to take our chances with something nobody understood. You literally had no control, once you started out in a Heechee ship. Their courses were built into their guidance system, in a way that nobody had figured out; you could pick a course, but once picked that was it—and you didn't know where it was going to take you when you picked it, any more than you know what's in your box of Cracker-Joy until you open it.

But they worked. They still worked, after what they say is maybe half a million years.

The first guy who had the guts to get into one and try to start it up succeeded. It lifted out of its crater on the surface of the asteroid. It turned fuzzy and bright, and was gone.

And three months later, it was back, with a starved, staring astronaut inside, aglow with triumph. He had been to another star! He had orbited a great gray planet with swirling yellow clouds, had managed to reverse the controls—and had been brought back right to the same pockmark, by the built-in guidance controls.

So they sent out another ship, this time one of the big pointy

morel-shaped ones, with a crew of four and plenty of rations and instrumentation. They were gone only about fifty days. In that time they had not only reached another solar system, they had actually used the lander to go down to the surface of a planet. There wasn't anything living there . . . but there had been.

They found the remnants. Not a lot. A few beat-up pieces of trash, on a corner of a mountaintop that had missed the general destruction that had hit the planet. Out of the radioactive dust they had picked up a brick, a ceramic bolt, a half-melted thing that looked as though it had once been a chromium flute.

Then the star rush began . . . and we were part of it.

V

Sigfrid is a pretty smart machine, but sometimes I can't figure out what's wrong with him. He's always asking me to tell him my dreams. Then sometimes I come in all aglow with some dream I'm positive he's going to love, a big-red-apple-for-the-teacher kind of dream, full of penis symbols and fetichism and guilt hangups, and he disappoints me. He takes off on some crazy track that has nothing at all to do with it. I tell him the whole thing, and then he sits and clicks and whirs and buzzes for a while—he doesn't really, but I fantasy that while I'm waiting—and then he says:

"Let's go back to something different, Bob. I'm interested in some of the things you've said about the woman, Gelle-Klara Moynlin."

I say, "Sigfrid, you're off on a wild-goose chase again."

"I don't think so, Bob."

"But that dream! My God, don't you see how important it is? What about the mother-figure in it?"

"What about letting me do my job, Bob?"

"Do I have a choice?" I say, feeling sulky.

"You always have a choice, Bob, but I would like very much to quote to you something you said a while ago." And he stops, and I hear my own voice coming out of somewhere in his tapes. I am saying:

"Sigfrid, there's an intensity of pain and guilt and misery there that I just can't handle."

He waits for me to say something.

After a moment I do. "That's a nice recording," I acknowledge, "but I'd rather talk about the way my mother-fixation comes out in my dream."

"I think it would be more productive to explore this other matter, Bob. It is possible they're related."

"Really?" I am all warmed up to discuss this theoretical possibility in a detached and philosophical way, but he beats me to the punch:

"The last conversation you had with Klara, Bob. Please tell me what you feel about it."

"I've told you." I am not enjoying this at all, it is such a waste of time, and I make sure he knows it by the tone of my voice and the tenseness of my body against the restraining straps. "It was even worse than with my mother."

"I know you'd rather switch to talking about your mother, Rob, but please don't, right now. Tell me about that time with Klara. What

are you feeling about it at this minute?''

I try to think it out honestly. After all, I can do that much. I don't actually have to say it. But all I can find to say is, ''Not much.''

After a little wait he says, ''Is that all, 'not much?' ''

''That's it. Not much.'' Not much on the surface, anyway. I do remember how I was feeling at the time. I open up that memory, very cautiously, to see what it was like. Going down into that blue mist. Seeing the dim ghost star for the first time. Talking to Klara on the radio, while Dane is whispering in my ear. . . . I close it up again.

''It all hurts, a lot, Sigfrid,'' I say conversationally. Sometimes I try to fool him by saying emotionally loaded things in the tone you might use to order a cup of coffee, but I don't think it works. Sigfrid listens to volume and overtones, but he also listens to breathing and pauses, as well as the sense of the words. He is extremely smart, considering how stupid he is.

VI

Five permanent-party noncoms, one from each of the cruisers, patted us down, checked our IDs and turned us over to a Corporation screening clerk. Sheri giggled when the Russian's pat hit a sensitive spot and whispered, ''What do they think we're smuggling *in*, Bob?'

I shushed her. The Corporation woman had taken our landing cards from the Chinese Spec/3 in charge of the detail and was calling out our names. There were eight of us all together. ''Welcome aboard,'' she said. ''Each one of you fish will get a proctor assigned to you. He'll help you get straightened out with a place to live, answer your questions, let you know where to report for the medical and your classes. Also he'll give you a copy of the contract to sign. You've each had eleven hundred and fifty dollars deducted from your cash on deposit with the ship that brought you here; that's your life-support tax for the first ten days. The rest you can draw on any time by writing a P-check. Your proctor will show you how. Linscott!''

The middle-aged black man from Baja California raised his hand. ''Your proctor is Shota Tarasvili. Broadhead!''

''Here I am.''

''Dane Metchnikov,'' said the Corporation clerk. I started to look around, but the person who had to be Dane Metchnikov was already coming toward me. He took my arm very firmly, started to lead me away and then said,

''Hi.''

I held back. ''I'd like to say good-by to my friend—''

''You're all in the same area,'' he grunted. ''Come on.''

So within two hours of arriving on Gateway I had a room, a proctor and a contract. I signed the articles of agreement right away. I didn't even read them. Metchnikov looked surprised. ''Don't you want to know what they say?''

''Not right this minute.'' I mean, what was the advantage? If I hadn't liked what they said, I might have changed my mind, and what other options did I have, really? Being a prospector is pretty scary. I *hate* the

I, _____, being of sound mind, hereby assign all rights in and to any discoveries, artifacts, objects and things of value of any description I may find during or as a result of exploration involving any craft furnished me or information given me by the Gateway Authority irrevocably to said Gateway Authority.

2. I understand that no contract I may have made with any person or group relating to any profits or income arising to me from this contract, or in any way purporting to affect my actions in regard to any activity undertaken under this contract, is binding, and I specifically disavow, terminate and cancel such contracts or undertakings, if any, and declare them null and void.

3. Gateway Authority may, in its own sole discretion, elect to sell, lease or otherwise dispose of any artifact, object or other thing of value arising from my activities under this contract. If it does so, it agrees to assign to me 50% (fifty per cent) of all revenues arising from such sale, lease or disposal, up to the costs of the exploration trip itself (including my own costs in coming to Gateway and my subsequent costs of living while there), and 10% (ten per cent) of all subsequent remedies once the aforesaid costs have been repaid. I accept this assignment as payment in full for any obligations arising to me from the Gateway Authority of whatever kind, and specifically undertake not to lay any claim for additional payment for any reason at any time.

4. I irrevocably grant to Gateway Authority the full power and authority to make decisions of all kinds relating to the exploitation, sales or lease of rights in any such discoveries, including the right, at Gateway Authority's sole discretion, to pool my discoveries or other things of value arising under this contract with those of others for purpose of exploitation, lease or sale, in which case my share shall be whatever proportion of such earnings Gateway Authority may deem proper; and I further grant to Gateway Authority the right to refrain from exploiting any or all such discoveries or things of value in any way, at its own sole discretion.

5. I release Gateway Authority from any and all claims by me or on my behalf arising from any injury, accident or loss of any kind to me in connection with my activities under this contract.

6. In the event of any disagreement arising from this Memorandum of Agreement, I agree that the terms shall be interpreted according to the laws and precedents of Gateway itself, and that no laws or precedents of any other jurisdiction shall be considered relevant in any degree.

idea of being killed. I hate the idea of dying at all, ever; not being alive any more, having everything stop, knowing that all those other people

would go on living and having sex and joy without me being there to share it. But I didn't hate it as much as I hated the idea of going back to the food mines.

Metchnikov hung himself by his collar to a hook on the wall of my room, to be out of the way while I put away my belongings. He was a squat, pale man, not very talkative. He didn't seem to be a very likeable person, but at least he didn't laugh at me because I was a clumsy new fish. Gateway is about as close to zero-G as you get. I had never experienced low-gravity before, you don't get much of it in Wyoming, so I kept misjudging. When I said something, Metchnikov said, "You'll get used to it. Have you got a toke?"

"Afraid not."

He sighed, looking a little like somebody's Buddha hung up on the wall, with his legs pulled up.

He looked at his time dial and said, "I'll take you out for a drink later. It's a custom. Only it's not very interesting until about twenty-two hundred. The Blue Hell'll be full of people then, and I'll introduce you around. See what you can find. What are you, straight, gay, what?"

"I'm pretty straight."

"Whatever. You're on your own about that, though. I'll introduce you to whoever I know, but then you're on your own. You better get used to that right away. Have you got your map?"

"Map?"

"Oh, hell, man! It's in that packet of stuff they gave you."

I opened the lockers at random until I found where I had put the envelope. Inside it were my copy of the articles of agreement, a booklet that said *Welcome to Gateway,* my room assignment, my health questionnaire that I would have to fill out before oh eight hundred the next morning . . . and a folded sheet that, opened up, looked like a wiring diagram with names on it.

"That's it. Can you locate where you are? Remember your room number: Level Babe, Quadrant East, Tunnel Eight, Room Fifty-one. Write it down."

"It's already written here, Dane, on my room assignment."

"Well, don't lose it." He reached behind his neck and unhooked himself, let himself fall gently to the floor. "So why don't you look around by yourself for a while. I'll meet you here. Anything else you need to know right now?"

I thought, while he looked impatient. "Well—mind if I ask you a question about you, Dane? Have you been out yet?"

"Six trips. All right, I'll see you at twenty-two hundred." He pushed the flexible door open, slipped out into the jungly green of the corridor and was gone.

I let myself flop—so gently, so slowly—into my one real chair and tried to make myself understand that I was on the doorstep of the universe.

* * *

I don't know if I can make you feel it, how the universe looked to me from Gateway: Like being young with Full Medical. Like a menu in the best restaurant in the world, when somebody else is

going to pick up the check. Like a girl you've just met who likes you. Like an unopened gift.

The things that hit you first on Gateway are the tininess of the tunnels, feeling tinier even than they are because they're lined with windowboxy things of plants; the vertigo from the low gravity; and the stink. You get Gateway a little bit at a time. There's no way of seeing it all in one glance, it is nothing but a maze of tunnels in the rock. I'm not even sure they've all been explored even yet. Certainly there are miles of them that nobody ever goes into, or not very often.

That's the way the Heechees were. They grabbed the asteroid, plated it over with wall metal, drove tunnels into it, filled them with whatever sort of possessions they had—most were empty by the time we got there, just as everything that ever belonged to the Heechees is, all over the universe. And then they left it, for whatever reason they left.

The closest thing to a central point in Gateway is Heecheetown. That's a spindle-shaped cave near the geometric center of the asteroid. They say that when the Heechees built Gateway they lived there. We lived there too, at first, or close to it, all of us new people off Earth. (And elsewhere. A ship from Venus had come in just before ours.) That's where the company housing is. Later on, if we got rich on a prospecting trip, we could move out farther toward the surface, where there was a little more gravity and less noise. And above all, less smell. A couple thousand people had breathed the air I was breathing, one time or another, voided the water I drank and exuded their smells into the atmosphere. The people didn't stay around very long, most of them. But the smells were still there.

I didn't care about the smell. I didn't care about any of it. Gateway was my big, fat lottery ticket to Full Medical, a nine-room house, a couple of kids and a lot of joy. I had won one lottery already. It made me cocky about my chances of winning another.

It was all exciting, although at the same time it was dingy enough, too. There wasn't much luxury around. For your $238,575 what you get is transportation to Gate-

WELCOME TO GATEWAY!

Congratulations!

You are one of a very few people each year who may become a limited partner in Gateway Enterprises, Inc. Your first obligation is to sign the enclosed Memorandum of Agreement. You need not do this at once. You are encouraged to study the agreement and to seek legal advice, if available.

However, until you sign you will not be eligible to occupy Corporation housing, dine at the Corporation commissary or participate in the Corporation instruction courses.

Accommodations are available at the Gateway Hotel and Restaurant for those who are here as visitors, or who do not at present wish to sign the Memorandum of Agreement.

way, ten days worth of food, lodging and air, a cram course in ship handling and an invitation to sign up on the next ship out. Or any ship you like. They don't *make* you take any particular ship, or for that matter any ship at all.

The Corporation doesn't make any profit on any of that. All the prices are fixed about at cost. That doesn't mean they were cheap, and it certainly doesn't mean that what you got was good. The food was just about what I had been digging, and eating, all my life. The lodging was about the size of a large steamer trunk, one chair, a bunch of lockers, a fold-down table and a hammock that you could stretch across it, corner to corner, when you wanted to sleep.

My next-door neighbors were a family from Venus. I caught a glimpse through the part-opened door. Imagine! Four of them sleeping in one of those cubicles! It looked like two to a hammock, with two hammocks criss-crossed across the room. On the other side was Sheri's room. I scratched at her door but she didn't answer. The door wasn't locked. Nobody locks his door much on Gateway, because there's nothing much worth stealing and for other reasons. Sheri wasn't there. The clothes she had been wearing on the ship were thrown all over.

I guessed that she had gone out exploring, and wished I had been a little earlier; I would have liked someone to explore with. I leaned against the ivy growing out of one wall of the tunnel and pulled out my map.

It did give me some idea of what to look for. There were things marked "Central Park" and "Lake Superior." What were they? I wondered about "Gateway Museum," which sounded interesting, and "Terminal Hospital," which sounded pretty bad—I found out later that "terminal" meant as in end of the line, on your return trip from wherever you went to. The Corporation must have known that it had another sound to it, too; but the Corporation never was much for sparing a prospector's feelings.

What I really wanted was to see a ship!

As soon as that thought percolated out of my mind I realized that I wanted it a *lot*. I puzzled over how to get to the outer skin, where the ship docks were of course located, holding onto a railing with one hand and trying to keep the map open with the other. It didn't take me long to locate myself. I was at a five-way intersection which seemed to be the one marked "East Star Babe G" on the map. One of the five tunnels out of it led to a drop shaft, but I couldn't tell which.

I tried one at random, wound up in a dead end and on the way back scratched on a door for directions. It opened. "Excuse me—" I said . . . and stopped.

The man who opened the door seemed as tall as I am, but was not. His eyes were on a level with my own. But he stopped at the waist. He had no legs.

He said something, but I didn't understand it; it wasn't in English. It wouldn't have mattered. My attention was taken up with him. He wore gauzy bright fabric strapped

from wrists to waist, and he fluttered the wings gently to stay in the air. It wasn't hard, in Gateway's low-G. But it was surprising to see. I said, "I'm sorry. I just wanted to know how to get to Level Tanya." I was trying not to stare, but I wasn't succeeding.

He smiled, white teeth in an unlined, old face. He had jet eyes under a crest of short white hair. He pushed past me out into the corridor and said in excellent English, "Certainly. Take the first turning on your right. Go to the next star, and take the second turning on your left. It'll be marked." He indicated with his chin the way toward the star.

I thanked him and left him floating behind me. I wanted to turn back, but it didn't seem good manners. It was strange. It hadn't occurred to me that there would be any cripples on Gateway.

That's how naive I was then.

Having seen him, I knew what I had already learned about Gateway in a way the statistics I had heard had never taught me. The statistics are clear enough, and we all studied them, all of us who came up as prospectors, and all of that vastly larger number who only wished they could. About eighty per cent of flights from Gateway come up empty. About fifteen per cent don't come back at all. So one person in twenty, on the average, returns from a prospecting trip with something that Gateway—that mankind in general—can make a profit on. Most of even those are lucky if they collect enough to pay their costs for getting here in the first place.

And if you get hurt while you're out, well, that's tough. Terminal Hospital is about as well equipped as any anywhere. But you have to get there for it to do you any good. You can be months in transit. If you get hurt at the other end of your trip—and that's where it usually happens—there's not much that can be done for you until you get back to Gateway. By then it can be too late to make you whole, and likely enough too late to keep you alive.

There's no charge for a return trip to where you came from, by the way. The rockets always come up fuller than they return. They call it wastage.

The return trip is free . . . but to what?

* * *

I let go the down-cable on Level Tanya, turned into a tunnel and ran into a man with cap and armband.

KEEPING GATEWAY GOING

In order to meet the costs of maintaining Gateway, all persons are required to pay a daily per-capita assessment for air, temperature control, administration and other services.

If you are a guest, this cost is included in your hotel bill.

Rates for other persons are posted. The tax may be prepaid up to one year in advance if desired. Failure to pay the daily per-capita tax will result in immediate expulsion from Gateway.

Note: Presence of a ship to receive expelled persons cannot be guaranteed.

Corporation Police. He didn't speak English, but he pointed and the size of him was convincing; I grabbed the up-cable, went up one level, crossed to another dropshaft and tried again.

The only difference was that this time the guard spoke English. "You can't come through here," he said.

"I just want to see the ships."

"Sure. You can't. You've got to have a blue badge," he said, tapping his own. "That's Corporation specialist, flight crew or V.I.P."

"I am flight crew."

He grinned. "You're a new fish off the Earth transport, aren't you? Friend, you'll be flight crew when you sign on for a flight and not before. Go on back up."

I said reasonably, "You understand how I feel, don't you? I just want to get a look."

"You can't, till you've finished your course, except they'll bring you down here for part of it. After that you'll see more than you want."

I argued a little more, but he had too many arguments on his side. But as I reached for the up-cable the tunnel seemed to lurch and a blast of sound hit my ears. For a minute I thought the asteroid was blowing up. I stared at the guard, who shrugged, not unfriendlily. "I only said you couldn't see them," he said. "I didn't say you couldn't hear them."

I bit back the "wow" or "Holy God!" that I really wanted to say, and said, "Where do you suppose that one's going?"

"Come back in six months. Maybe we'll know by then."

Well, there was nothing in that to feel elated about. All the same, I felt elated. After all those years in the food mines, here I was, not only on Gateway, but right there when some of those intrepid prospectors set out on a trip that would bring them fame and incredible fortune! Never mind the odds. This was really living on the top line.

So I wasn't paying much attention to what I was doing, and as a result I got lost again on the way back. I reached Level Baby ten minutes late.

Dane Metchnikov was striding down the tunnel away from my room. He didn't appear to recognize me. I think he might have passed me if I hadn't put out my arm.

"Huh," he grunted. "You're late."

"I was down on Level Tanya, trying to get a look at the ships."

"Huh. You can't go down there unless you have a blue badge or a bangle."

Well, I had found that out already, hadn't I? So I tagged along after him, without wasting energy on attempts at further conversation.

Metchnikov was a pale man, except for the marvelously ornate curled whisker that followed the line of his jaw. It seemed to be waxed, so that each separate curl stood out with a life of its own. "Waxed" was wrong. It had something in it besides hair, but whatever it was wasn't stiff. The whole thing moved as he moved, and when he talked or smiled the muscles moored to the jawbone made the beard ripple and flow. He finally did smile, after we got to the Blue Hell. He bought the first drink, explaining carefully that that

was the custom, but that the custom only called for one. I bought the second. The smile came when, out of turn, I also bought the third.

Over the noise in the Blue Hell talk wasn't easy, but I told him about hearing a launch. "Right," he said, lifting his glass. "Hope they have a good trip." He wore six blue-glowing Heechee metal bracelets, hardly thicker than wire. They tinkled faintly as he swallowed half the drink.

"Are they what I think they are?" I asked. "One for every trip out?"

He drank the other half of the drink. "That's right. Now I'm going to dance," He said. I looked after his back as he lunged toward a woman in a luminous pink sari. He wasn't much of a talker, that was sure.

On the other hand, in that noise level you couldn't talk much anyhow. You couldn't really dance much, either. The Blue Hell was up in the center of Gateway, part of the spindle-shaped cave. Rotational G was so low that we didn't weigh more than two or three pounds; if anyone had tried to waltz or polka he would have gone flying. So they did those no-touching junior-high-school sort of dances that appear to be designed so fourteen-year-old boys won't have to look up at too sharp an angle to the fourteen-year-old girls they're dancing with. You pretty much kept your feet in place, and your head and arms and shoulders and hips went where they wanted to. Me, I like to touch. But you can't have everything. I like to dance anyway.

I saw Sheri, way across the room, with an older woman I took to be her proctor, and danced one with her. "How do you like it so far?" I shouted over the tapes. She nodded and shouted something back, I couldn't say what. I danced with an immense black woman who wore two blue bracelets, then with Sheri again, then with a girl Dane Metchnikov dropped on me, apparently because he wanted to be rid of her, then with a tall, strong-faced woman with the blackest, thickest eyebrows I had ever seen under a female hairdo. (She wore it pulled back in two pigtails that floated around behind her as she moved.) *She* wore a couple of bracelets, too. And between dances I drank.

They had tables that were meant

WHAT IS GATEWAY?

Gateway is an artifact created by the so-called Heechee. It appears to have been formed around an asteroid, or the core of an atypical comet. The time of this event is not known, but almost surely precedes the rise of human civilization.

Inside Gateway the environment resembles Earth, except that there is relatively little gravity. (Actually there is virtually none, but centrifugal force derived from Gateway's rotation gives a similar effect.) If you have come from Earth you will notice some difficulty in breathing for the first few days because of the low atmospheric pressure. However, the partial pressure of oxygen is identical with the 2000-meter elevation at Earth and is fully adequate for all persons in normal health.

SYLVESTER MACKLEN: FATHER OF GATEWAY

Gateway was discovered by Sylvester Macklen, a tunnel explorer on Venus, who found an operable Heechee spacecraft in a dig. He succeeded in getting it to the surface and bringing it to Gateway, where it now rests in Dock 5-33. Tragically, Macklen was not able to return and, although he succeeded in signalling his presence by exploding the fuel tank of the lander of his ship, he was dead before investigators reached Gateway.

Macklen was a courageous and resourceful man, and the plaque at Dock 5-33 commemorates his unique service to humanity. Services are held at appropriate times by representatives of the various faiths.

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for parties of eight or ten, but there weren't any parties of eight or ten. People sat where they wanted to, and took each other's seats without worrying about whether the owner was coming back. For a while there were half a dozen crewmen in Brazilian navy dress whites sitting with me, talking to each other in Portuguese. A man with one golden earring joined me for a while, but I couldn't understand what he was saying, either. (I did, pretty well, understand what he meant.)

There was that trouble all the time I was in Gateway. There always is. Gateway sounds like an international conference when the translation has broken down. There's a sort of lingua franca you hear a lot, pieces of a dozen different languages thrown together, like, "*Ecoutez, gospodin, tu es verrückt.*" I danced twice with one of the Brazilians, a skinny, dark little girl with a hawk nose but sweet brown eyes, and tried to say a few simple words. Maybe she understood me. One of the men she was with, though, spoke fine English, introduced himself and the others all around. I didn't catch any of the names but his, Francesco Hereira. He bought me a drink, and let me buy one for the crowd, and then I realized I'd seen him before: He was one of the detail that searched us on the way in.

While we were commenting on that, Dane leaned over me and grunted in my ear, "I'm going to gamble. So long, unless you really want to come."

It wasn't the warmest invitation I'd ever had, but the noise in the Blue Hell was getting heavy. I tagged after him and discovered a whole full-scale casino just next to the Blue Hell, with blackjack tables, poker, a sort of slow-motion roulette with a big, dense ball, craps with dice that took forever to stop, even a roped off section for baccarat. Metchnikov headed for the blackjack tables and drummed his fingers on the back of a player's chair, waiting for an opening. Around then he noticed I had come with him.

"Oh." He looked around the room. "What do you like to play?"

"I've played it all," I said, slurring the words a little. Bragging a little, too. "Maybe a little baccarat."

He looked at me first with re-

spect, then amusement. "Fifty's the minimum bet."

I had five or six thousand dollars left in my account. I shrugged.

"That's fifty thousand," he said.

I choked. He said absently, moving over behind a player whose chip stack was running out, "You can get down for ten dollars at roulette. Hundred minimum for most of the others. Oh, there's a ten-dollar slot machine around somewhere, I think." He dived for the open chair and that was the last I saw of him.

I watched for a moment, and realized that the black-eyebrowed girl was at the same table, busy studying her cards. She didn't look up.

I could see I wasn't going to be able to afford much gambling here. At that point I realized I couldn't really afford all the drinks I'd been buying, either, and then my interior sensory system began to make me realize just how many of those drinks I had had. The last thing I realized was that I had to get back to my room, pretty fast.

VII

I am on the mat, and I am not very comfortable. Physically, I mean. I have had an operation not long ago and probably the stitches aren't yet absorbed.

Sigfrid says, "We were talking about your job, Bob."

That's dull enough. But safe enough. I say, "I hated my job. Who wouldn't hate the food mines?"

"But you kept it, Bob. You never even tried to get on anywhere else. You could have switched to sea-farming, maybe. And you dropped out of school."

"You're saying I stuck myself in a rut?"

"I'm not saying anything, Bob. I'm asking you what you feel."

"Well. I guess in a sense I did do that. I thought about making some kind of a change. I thought about it a lot," I say, remembering how it was in those bright early days with Sylvia. I remember sitting with her in the cockpit of a parked sailplane on a January night—we had no other place to go—and talking about the future. What we would do. How we would beat the odds. There's nothing there for Sigfrid, as far as I can see. I've told Sigfrid all about Sylvia, who married a stockholder in the long run. But we'd broken up long before that. "I suppose," I say, pulling myself up short and trying to get my money's worth out of this session, "that I had a kind of death wish."

"I prefer that you don't use psychiatric terms, Bob."

"Well, you understand what I mean. I knew time was going by. The longer I stayed in the mines the harder it would be to get out. But nothing else looked any better. And there were compensations. My girlfriend, Sylvia. My mother, while she was alive. Friends. Even some fun things. Sailplaning. It is great over the hills, and when you're up high enough Wyoming doesn't look so bad and you can hardly smell the oil."

"You mentioned your girl friend, Sylvia. Did you get along with her?"

I hesitated, rubbing at my belly. I

have almost half a meter of new intestine in there now. They cost fearfully, those things, and sometimes you get the feeling the previous owner wants them back. You wonder who he was. Or she. How he died. Or did he die? Could he still be alive, so poor that he sells off parts of himself, the way I've heard of pretty girls doing with a well-shaped breast or ear?

"Did you make friends with girls easily, Bob?"

"I do now, all right."

"Not now, Bob. I think you said you didn't make friends easily as a child."

"Does anyone?"

"If I understand that question, Robbie, you are asking if anyone remembers childhood as a perfectly happy and easy experience, and of course the answer is 'no.' But some people seem to carry the effects of it over into their lives more than others."

"Yeah. I guess, thinking back, that I was a little afraid of my peer group—(Sorry about that, Sigfrid! I mean the other kids.)They all seemed to know each other. They had things to say to each other all the time. Secrets. Shared experiences. Interests. I was a loner."

"You were an only child, Robbie?"

"You know I was. Yeah. Maybe that was it. Both my parents worked. And they didn't like me playing near the mines. Dangerous. Well, it really was dangerous for kids. You can get hurt around those machines, or even if there's a slide in the tailings or an outgassing. I stayed at home a lot, watching shows, playing cassettes. Eating. I was a fat kid, Sigfrid. I loved all the starchy, sugary stuff with all the calories. They spoiled me, buying me more food than I needed."

I still like to be spoiled. Now I get a higher class of diet, not as fattening, about a thousand times as expensive. I've had real caviar. Often. It gets flown in from the aquarium at Galveston. I have real champagne, and butter. . . . "I remember lying in bed," I say—"I guess I was very small, maybe about three. I had a teddy-

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507 IRRAY .MATURITY. GOTO *M88                          26,830

508 ,C, Maybe maturity is wanting what you want,        26,835

    instead of what somebody else tells you
    you should                                          26,840
    want.                                               26,845

511 XTERNALS @ IF @ GOTO &&                             26,850

512 ,S, Maybe, Sigfrid, dear old tin god,
    but what it                                         26,855
    feels like is mature is dead.                       26,860
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talker. I took it to bed with me, and it told me little stories, and I stuck pencils into it and tried to pull its ears off. I loved that thing, Sigfrid."

I stop, and Sigfrid picks up immediately. "Why are you crying, Robbie?"

"I don't know!" I bawl, tears running down my face, and I look at my watch, the skipping green numerals rippling through the tears. "Oh," I say, and sit up, very conversationally, the tears still rolling down my face but the fountain turned off, "I've really got to go now, Sigfrid. I've got a date. Her name's Tania. Beautiful girl. The Houston Symphony. She loves Mendelssohn and roses, and I want to see if I can pick up some of those dark-blue hybrids that will go with her eyes."

"Rob, we've got nearly ten minutes left."

"I'll make it up another time." I know he can't do that, so I add quickly, "May I use your bathroom? I need to."

"Are you going to excrete your feelings, Rob?"

"Oh, don't be smart. I know what you're saying. I know this looks like a typical displacement mechanism—"

"Rob."

"—all right, I mean, it looks like I'm copping out. But I honestly do have to go. To the bathroom, I mean. And to the florist's, too. Tani is pretty special. She's a fine person. I'm not talking about sex, but that's great too. She can g— She can—"

"What are you trying to say?"

I take a breath and manage to say: "She's great at oral sex, Sigfrid."

"Rob?"

I recognize that tone. Sigfrid's repertory of vocal modes is quite large, but parts of it I have learned to identify. He thinks he is on the track of something.

"What?"

"Bob, what do you call it when a woman gives you oral sex?"

"Oh, Christ, Sigfrid, what kind of dumb game is this one?"

"What do you call it, Bob?"

"Ah! You know as well as I."

"Please tell me what you call it."

"They say, like, "She eats me.' "

"What other expression, Bob?"

"Lots of them! 'Giving head,' that's one. I guess I've heard a thousand terms for it."

"What other, Bob?"

I have been building up to rage and pain and it suddenly boils over. "Don't play these fucking games with me, Sigfrid!" My gut aches, and I am afraid I am going to mess my pants, it is like being a baby again. "Jesus, Sigfrid! When I was a little kid I used to talk to my teddy. Now I'm forty-five and I'm still talking to a stupid machine as if it was alive!"

"But there is another term, isn't there, Bob?"

"There are thousands of them! Which one do you want?"

"I want the expression you were going to use and didn't, Bob. Please try to say it. That term means something special to you, so much so that you can't say the words without trouble."

I crumple over onto the mat, and now I'm really crying.

WHO OWNS GATEWAY?

Gateway is unique in the history of humanity, and it was quickly realized that it was too valuable a resource to be given to any one group of persons, or any one government.' Therefore Gateway Enterprises, Inc. was formed.

Gateway Enterprises (usually referred to as "the Corporation") is a multinational corporation whose general partners are the governments of The United States of America, The Soviet Union, The United States of Brazil, The Venusian Confederation and New People's Asia, and whose limited partners are all those persons who, like yourself, have signed the attached Memorandum of Agreement.

"Please say it, Bob. What's the term?"

"Damn you, Sigfrid! Going down! That's it. Going down, going down, going down!"

VIII

"Good morning," said somebody, speaking right into the middle of a dream about getting stuck in a sort of quicksand in the middle of the Orion Nebula. "I have brought you some tea."

I opened an eye. I looked over the edge of the hammock into a nearby pair of coalsack-black eyes set into a sand-colored face. I was fully dressed and hung over; something smelled very bad, and I realized it was me.

"My name," said the person with the tea, "is Shikitei Bakin. Please drink this tea. It will help rehydrate your tissues."

I looked a little further and saw that he ended at the waist; he was the legless man with the strap-on wings whom I had seen in the tunnel the day before. "Uh," I said, and tried a little harder and got as far as, "Good morning." The Orion Nebula was fading back into the dream, and so was the sensation of having to push through rapidly solidifying gas clouds. The bad smell remained. The room smelled excessively foul, even by Gateway standards, and I realized I had thrown up on the floor. I was only millimeters from doing it again. Bakin, slowly stroking the air with his wings, dexterously dropped a stoppered flask next to me on the hammock at the end of one stroke. Then he propelled himself to the top of my chest of drawers, sat and said:

"I believe you have a medical examination this morning at oh eight hundred hours."

"Do I?" I managed to get the cap off the tea and took a sip. It was very hot, sugarless and almost tasteless, but it did seem to tip the scales inside my gut in the direction opposite to throwing up.

"Yes. I think so. It's customary. And in addition, your P-phone has rung several times."

I went back to, "Uh?"

"I presume it was your proctor calling you to remind you. It is now seven-fifteen, Mr.—"

"Broadhead," I said thickly, and then more carefully: "My name is Bob Broadhead."

"Yes. I took the liberty of making sure you were awake. Please

enjoy your tea, Mr. Broadhead. Enjoy your stay on Gateway."

He nodded, fell forward off the chest, swooped toward the door, handed himself through it and was gone. With my head thudding at every change of attitude I got myself out of the hammock, trying to avoid the nastier spots on the floor, and somehow succeeded in getting reasonably clean. I thought of depilating, but I had about twelve days on a beard and decided to let it go for a while; it no longer looked unshaven, exactly.

When I wobbled into the medical examining room I was only about five minutes late. The others in my group were all ahead of me, so I had to wait and go last. They extracted three kinds of blood from me, fingertip, inside of the elbow and lobe of the ear; I was sure they would all run ninety proof. But it didn't matter. The medical was only a formality. If you could survive the trip up to Gateway by spacecraft in the first place you could survive a trip in a Heechee ship. Unless something went wrong. In which case you probably couldn't survive anyway, no matter how healthy you were.

* * *

I had time for a quick cup of coffee off a cart that someone was tending next to a dropshaft (private enterprise on Gateway? I hadn't known that existed), and then I got to the first session of the class right on the tick. We met in a big room on Level Dog, long and narrow and low-ceilinged. The seats were arranged two on each side with a center aisle, sort of like a schoolroom in a converted bus. Sheri came in late, looking fresh and cheerful, and slipped in beside me; our whole group was there, all seven of us who had come up from Earth together, the family of four from Venus and a couple others I knew to be new fish like me. "You don't look *too* bad," Sheri whispered as the instructor pondered over some papers on his desk.

"Does the hangover show?"

"Actually not. But I assume it's there. I heard you coming in last night. In fact," she added thoughtfully, "the whole tunnel heard you."

I winced. I could still smell myself, but most of it was apparently inside me. None of the others seemed to be edging away, not even Sheri.

The instructor stood up and studied us thoughtfully for a while. "Oh, well," he said, and looked at his paper. Then he shook his head. "I won't take attendance," he said. "My name's Rocco Riccieri, and I teach the course in how to run a Heechee ship." I noticed he had a batch of bracelets; I couldn't count them, but there were at least half a dozen. I wondered briefly about these people I kept seeing who had been out a lot of times and still weren't rich. "This is only one of the three courses you get. After this you get survival in unfamiliar environments, and then how to recognize what's valuable. But this one is in ship-handling, and the way we're going to start learning it is by doing it. All of you come with me."

So we all got up and gaggled after him, out of the room, down a tunnel, onto the down-cable of a



dropshaft and past the guards—maybe the same ones who had chased me away the night before. This time they just nodded to Riccieri and watched us go past. We wound up in a long, wide, low-ceilinged passage with about a dozen squared-off and stained metal cylinders sticking up out of the floor. They looked like charred tree-stumps, and it was a moment before I realized what they were.

I gulped.

"They're *ships*," I whispered to Sheri, louder than I intended. A couple of people looked at me curiously. One of them, I noticed, was a girl I had danced with the night before, the one with the dense black eyebrows. She nodded to me and smiled; I saw the bangles on her arm, and wondered what she was doing there—and how she had done at the gambling tables.

The instructor gathered us around him and said, "As someone just said, these are Heechee ships. The lander part. This is the piece you go down to a planet in, if you're lucky enough to find a planet. They don't look very big, but five people can fit into each of those garbage cans you see. Not comfortably, exactly. But they can. Generally speaking, of course, you'll always leave one person in the main ship, so there'll be at most four in the lander."

He led us past the nearest of them, and we all satisfied the impulse to touch, scratch or pat it. Then he began to lecture:

"There were nine hundred and twenty-four of these ships docked at Gateway when it was first explored. About two hundred, so far, have proved non-operational. Mostly we don't know why; they just don't work. Three hundred and four have actually been sent out on at least one trip. Thirty-three of those are here now, and available for prospecting trips. The others haven't been tried yet." He hiked himself up on the stumpy cylinder and sat

there while he went on:

"One thing you have to decide is whether you want to take one of the thirty-three tested ones or one of the ones that has never been flown. By human beings, I mean. There you just pay your money and take your choice. It's a gamble either way. A high proportion of the trips that didn't come back were in first flights, so there's obviously some risk there. Well, that figures, doesn't it? After all, nobody has done any maintenance on them for God knows how long, since the Heechee put them there.

"On the other hand, there's a risk in the ones that have been out and back safely, too. There's no such thing as perpetual motion. We think some of the no-returns have been because the ships ran out of fuel. Trouble is, we don't know what the fuel is, or how much there is, or how to tell when a ship is about to run out."

He patted the stump. "This, and all the others you see here, were designed to hold five Heechee. As far as we can tell. But we send them out with three human beings. It seems the Heechee were more tolerant of each other's company in confined spaces than people are. There are bigger and smaller ships, but the no-return rate on them has been very bad the last couple of orbits. It's probably just a string of bad luck, but—Anyway, I personally would stick with a Three. You people, you do what you want.

"So you come to your second choice, which is who you go with. Keep your eyes open—What?" Sheri said, "How bad is very bad?"

The instructor said patiently, "In the last fiscal orbit about three out of ten Fives came back. Those are the biggest ships. In several cases the crews were dead when we got them open, even so."

"Yeah," said Sheri, "that's bad."

"No, that's not bad at all, compared to the one-man ships. Two orbits ago we went a whole orbit and only two Ones came back at all. *That's* bad."

"Why is that?" asked the father of the tunnel-rat family. Their name was Forehand. The instructor looked at him for a moment.

"If you ever find out," he said, "be sure and tell somebody. . . . Now. As far as selecting a crew is concerned, you're better off if you can get somebody who's already been out. Maybe you can, maybe you can't. Prospectors who strike it rich generally quit; the ones that are still hungry may not want to break up their teams. So a lot of you fish are going to have to go out with other virgins. Um." He looked around thoughtfully. "Well, let's get our feet wet. Sort yourselves out into groups of three—don't worry about who's in your group, this isn't where you pick your partners—and climb into one of those open landers. Don't touch anything. They're supposed to be in deactive mode, but I have to tell you they don't always *stay* deactive. Just go in, climb down to the control cabin and wait for an instructor."

That was the first I'd heard that there were other instructors. I looked around, trying to work out which were teachers and which were fish, while he said, "Are there any questions?"

WHAT DOES THE CORPORATION DO?

The purpose of the Corporation is to exploit the spacecraft left by the Heechee, and to trade in, develop or otherwise utilize all artifacts, goods, raw materials or other things of value discovered by means of these vessels.

The Corporation encourages commercial development of Heechee technology, and grants leases on a royalty basis for this purpose.

Its revenues are used to pay appropriate shares to limited partners, such as you, who have been instrumental in discovering new things of value; to pay the costs of maintaining Gateway itself over and above the per-capita tax contribution; to pay to each of the general partners an annual sum sufficient to cover the cost of maintaining surveillance by means of the space cruisers you will have observed in orbit nearby; to create and maintain an adequate reserve for contingencies; and to use the balance of its income to subsidize research and development on the objects of value themselves.

In the fiscal year ending February 30th last, the total revenues of the Corporation exceeded 3.7×10^{12} dollars U.S.

Sheri again. "Yeah. What's your name?"

"Did I forget that again? I'm Jimmy Chou. Pleased to meet you all. Now let's go."

Now I know a lot more than my instructor did, including what happened to him half an orbit later—poor old Jimmy Chou, he went out before I did, and came back while I was on my second trip, very dead. Flare burns, they say his eyes were boiled out of his head. But at that time he knew it all, and it was all very strange and wonderful to me.

So we crawled into the funny elliptical hatch that let you slip between the thrusters and down into the landing capsule, and then down a peg-ladder one step further into the main vehicle itself.

We looked around, three Ali Babas staring at the treasure cave. We heard a scratching above us, and a head poked in. It had shaggy eyebrows and pretty eyes, and it belonged to the girl I had been dancing with the night before. "Having fun?" she inquired. We were clinging together as far from anything that looked moveable as we could get, and I doubt we really looked at ease. "Never mind," she said, "just look around, get familiar with it. You'll see a lot of it. That vertical line of wheels with the little spokes sticking out of them? That's the target selector. That's the most important thing not to touch for now—maybe ever. That golden spiral thing over next to you there, the blonde girl? Anybody want to guess what that's for?"

You-there-blonde-girl, who was one of the Forehand daughters, shrank away from it and shook her head. I shook mine, but Sheri hazarded, "Could it be a hatrack?"

Teacher squinted at it thoughtfully. "Hmm. No, I don't think so, but I keep hoping one of you fish

will know the answer. None of us here do. It gets hot sometimes in flight; nobody knows why. The toilet's in there. You're going to have a lot of fun with *that*. But it does work, after you learn how. You can sling your hammocks and sleep there—or anywhere you want to, actually. That corner, and that recess are fairly dead space. If you're in a crew that wants some privacy, you can screen them off. A little bit, anyway."

Sheri said, "Don't any of you people like to tell your names?"

Teacher grinned. "I'm Gelle-Klara Moynlin. You want to know the rest about me? I've been out twice and didn't score, and I'm killing time until the right trip comes along. So I work as assistant instructor."

"How do you know which is the right trip?" asked the Forehand girl.

"Bright fellow, you. Good question. That's another of those questions that I like to hear you ask, because it shows you're thinking, but if there's an answer I don't know what it is. Let's see. You already know this ship is a Three. It's done six round trips already, but it's a reasonable bet that it's got enough reserve fuel for a couple more. I'd rather take it than a One. That's for long-shot gamblers."

"Mr. Chou said that," said the Forehand girl, "but my father says he's been all through the records since Orbit One and the Ones aren't that bad."

"Your father can have mine," said Gelle-Klara Moynlin. "It's not just statistics. Ones are lonesome. Anyway, one person can't really handle everything if you hit lucky, you need shipmates, one in orbit—most of us keep one man in the ship, feels safer that way; at least somebody *might* get help if things go rancid. So two of you go down in the lander to look around. Of course, if you do hit lucky you have to split it three ways. If you hit anything big, there's plenty to go around. And if you don't hit, one-third of nothing is no less than all of it."

"Wouldn't it be even better in a Five, then?" I asked.

Klara looked at me and half-winked; I hadn't thought she remembered dancing the night before. "Maybe, maybe not. The thing about Fives is that they have almost unlimited target acceptance."

"Please talk English," Sheri coaxed.

"Fives will accept a lot of destinations that Threes and Ones won't. *I* think it's because some of those destinations are dangerous. The worst ship I ever saw come back was a Five. All scarred and seared and bent; nobody knows how it made it back at all. Nobody knows where it had been, either, but I heard somebody say it might've actually been in the photosphere of a star. The crew couldn't tell us. They were dead.

"Of course," she went on meditatively, "an armored Three has almost as much target acceptance as a Five, but you take your chances any way you swing. Now let's get with it, shall we? You—" she pointed at Sheri—" sit down over there."

The Forehand girl and I crawled around the mix of human and Heechee furnishing to make room.

GATEWAY'S SHIPS

The vessels available on Gateway are capable of interstellar flight at speeds greater than the velocity of light. The means of propulsion is not understood (see pilot manual.) There is also a fairly conventional rocket-propulsion system, using liquid hydrogen and liquid oxygen, for attitude control, and for propulsion of the landing craft that is docked into each interstellar vessel.

There are three major classifications, designated as Class 1, Class 3 and Class 5, according to the number of persons they can carry. Some of the vessels are of particularly heavy construction and are designated "armored." Most of the armored class are Fives.

Each vessel is programmed to navigate itself automatically to a number of destinations. Return is automatic, and is quite reliable in practice. Your course in ship handling will adequately prepare you for all the necessary tasks in piloting your vessel safely; however, see pilot manual for safety regulations.

There wasn't much. If you cleared everything out of a Three you'd have a room about four meters by three by three, but of course if you cleared everything out it wouldn't go.

Sheri sat down in front of the column of spoked wheels, wriggling her bottom to try to get a fit. "What kind of behinds did the Heechee have?" she complained.

Teacher said, "Another good question, same no-good answer. If you find out, tell us. The Corporation puts that webbing in the seat. It isn't original equipment. Okay. Now, that thing you're looking at is the target selector. Put your hand on *one* of the wheels. Any one. Just don't touch any other. Now move it." She peered down anxiously as Sheri touched the bottom wheel, then thrust with her fingers, then laid the heel of her hand on it, braced herself against the V-shaped arms of the seat and shoved. Finally it moved, and the lights along the row of wheels began to flicker.

"Wow," said Sheri, "they must've been pretty strong!"

We took turns trying with that one wheel—Klara wouldn't let us touch any other that day—and when it came my turn I was surprised to find that it took about as much muscle as I could bring to bear to make it move. It didn't feel rusted stuck, it felt as though it were meant to be hard to turn. And, when you think how much trouble you can get into if you turn a setting by accident in the middle of a flight, it probably was.

* * *

Of course, now I know more about that, too, than my teacher did then. Not that I'm so smart, but it has taken, and is still taking, a lot of people a hell of a long time to figure out what goes on just in setting up a target on the course director.

What it is is a vertical row of number generators. The lights that

show up display numbers; that's not easy to see, because they don't *look* like numbers. They aren't positional, or decimal. (Apparently the Heechee expressed numbers as sums of primes and exponents, but all that's way over my head.) Only the check-pilots and the course-programmers working for the Corporation really have to be able to read the numbers, and they don't do it directly, only with a computing translator. The first five digits appear to express the position of the target in space, reading from bottom to top. (Dane Metchnikov says the prime ordering isn't from bottom to top but from front to back, which says something or other about the Heechee. They were three-D oriented, like primitive man, instead of two-D oriented, like us.) You would think that three numbers would be enough to describe any position anywhere in the universe, wouldn't you? I mean, if you make a three-dimensional representation of the Galaxy you can express any point in it by means of a number for each of the three dimensions. But it took the Heechee five. Does that mean there were five dimensions that were perceptible to the Heechee? Metchnikov says not. . .

Anyway. Once you get a lock on the first five numbers, the other seven can be turned to quite arbitrary settings and you'll still go when you squeeze the action teat.

What you usually do—or what the course-programmers the Corporation keeps on the payroll to do this sort of thing for you usually do—is pick four numbers at random. Then you cycle the fifth digit until you get a kind of warning pink glow. Sometimes it's faint, sometimes it's bright. If you stop there and press the flat oval part under the teat, the other numbers begin to creep around, just a couple of millimeters one way or another, and the pink glow gets brighter. When they stop it's shocking pink and shockingly bright. Metchnikov says that's an automatic fine-tuning device. The machine allows for human error—sorry, I mean for Heechee error—so when you get close to a real, valid target setting it makes the final adjustments for you automatically. Probably he's right.

(Of course, learning every step of this cost a lot of time and money, and most of it cost some lives. It's dangerous being a prospector; for the first few out, it was more like suicidal.)

Sometimes you can cycle all the way through your fifth digit and get nothing at all. So what you do, you swear. Then you reset one of the other four and go again. It only takes a few seconds to cycle, but check-pilots have run up a hundred hours of new settings before they got good color.

Of course, by the time I went out the check-pilots and the course-programmers had worked out a couple hundred possible settings that had been logged as good color but not as yet used—as well as all the settings that had been used, and aren't worth going back to. Or that the crews didn't come back from.

But I didn't know all that at the time, and when I sat down in that modified Heechee seat it was all new. And I don't know if I can make you understand what it felt like.

I mean, there I was, in a seat where Heechee had sat half a million years ago. The thing in front of me was a target selector. The ship could go *anywhere*. Anywhere! If I selected the right target I could find myself around Sirius, Procyon, maybe even the Magellanic Clouds!

Teacher got tired of hanging head-down and wriggled through, squeezing in behind me. "Your turn, Broadhead," she said, resting a hand on my shoulder and what felt like her breasts on my back.

I was reluctant to touch. I asked, "Isn't there any way of telling where you're going to wind up?"

"Probably," she said, "providing you're a Heechee with pilot training."

"Not even like one color means you're going farther from here than some other color?"

"Not that anybody here has figured out. Of course, they keep trying. There's a whole team that spends its time programming returned-mission reports against the settings they went out with. So far they've come up empty. Now let's get on with it, Broadhead. Put your whole hand on that first wheel, the one the others have used. Shove it. It'll take more muscle than you think."

It did. In fact, I was almost afraid to push it hard enough to make it work. She leaned over and put her hand on mine, and I realized that the nice musk-oil smell that had been in my nostrils for the last little while was her. It wasn't just musk, either; her pheromones were snuggling nicely into my chemoreceptors. It made a nice change from the rest of the Gateway stink.

But all the same, I didn't get even a show of color, although I tried for five minutes before she waved me away and gave Sheri another shot in my place.

* * *

When I got back to my room somebody had cleaned it up. I wondered gratefully who that had been, but I was too tired to wonder very long. Until you get used to it, low-gravity can be exhausting; you find yourself overusing all your muscles because you have to relearn a whole pattern of economies.

I slung my hammock and was just dozing off when I heard a scratching at the lattice of my door and Sheri's voice: "Bob?"

"What?"

"Are you asleep?"

Obviously I wasn't, but I interpreted the question the way she had intended it. "No. I've been lying here thinking."

"So was I. . . . Bob?"

"Yeah?"

"Would you like me to come into your hammock?"

I made an effort to wake myself up enough to consider the question on its merits.

"I really want to," she said.

"All right. Sure. I mean, glad to have you." She slipped into my room, and I slid over in the hammock, which swung slowly as she crawled into it. She was wearing a knitted T-shirt and underpants, and she felt warm and soft against me when we rolled gently together in the hollow of the hammock.

"It doesn't have to be sex, stud," she said. "I'm easy either way."

"Let's see what develops. Are you scared?"

Her breath was the sweetest-smelling thing about her; I could feel it on my cheek. "A lot more than I thought I would be."

"Why?"

"Bob—" she squirmed herself comfortable and then twisted her neck to look at me over her shoulder—"you know, you say kind of asshole things sometimes?"

"Sorry."

"Well, I mean it. I mean, look what we're doing. We're going to get into a ship that we don't know if it's going to get where it's supposed to go, and we don't even know where it's supposed to go. We go faster than light, nobody knows how. We don't know how long we'll be gone, even if we knew where we were going. So we could be traveling the rest of our lives and die before we got there, even if we didn't run into something that would kill us in two seconds. Right? Right. So how come you ask me why I'm scared?"

"Just making conversation." I curled up along her back and cupped a breast, not aggressively but because it felt good.

"And not only that. We don't know anything about the people who built these things. How do we know this isn't all a practical joke on their part? Maybe their way of luring fresh meat into Heechee heaven?"

"We don't," I agreed. "Roll over this way."

"And the ship they showed us this morning doesn't hardly look like I thought it was going to be, at all," she said, doing as I told her and putting a hand on the back of my neck.

There was a sharp whistle from somewhere, I couldn't tell where.

"What's that?"

"I don't know." It came again, sounding both out in the tunnel and, louder, inside my room. "Oh, it's the phone." What I was hearing was my own piezophone and the ones on either side of me, all ringing at once. The whistle stopped and there was a voice:

"This is Jim Chou. All you fish who want to see what a ship looks like when it comes back after a bad trip, come down to Docking Station Four. They're bringing it in now."

I could hear a murmuring from the Forehands' room next door, and I could feel Sheri's heart pounding. "We'd better go," I said.

"I know. But I don't think I want to much—"

* * *

The ship had made it back to Gateway, but not quite all the way.

Classifieds.

HOW DO you know you're not a Unitarian? Gateway Fellowship now forming. 87-539.

BELITUS WANTED for Sappho and Lesbia, joint trips till we make it, then happily ever after in Northern Ireland. Permanent trimarriage only. 87-033 or 87-034.

STORE YOUR effects. Save rent, avoid Corporation seizure while out. Fee includes disposal instructions if non-return. 88-125.

SAFETY RULES FOR GATEWAY SHIPS

The mechanism for interstellar travel is known to be contained in the diamond-shaped box which is located under the center-keel of 3-man and 5-man ships, and in the sanitary facilities of the 1-man ships.

No one has successfully opened one of these containers. Each attempt has resulted in explosion of approximately 1-kiloton force. A major research project is attempting to penetrate this box without destroying it, and if you as a limited partner have any information or suggestions in this connection you should contact a Corporation officer at once.

However, under no circumstances attempt to open the box yourself! Tampering with it in any way, or docking a vessel on which the box has been tampered with, is strictly forbidden. The penalty is forfeiture of all rights and immediate expulsion from Gateway.

The course-directing equipment also poses a potential danger. Under no circumstances should you attempt to change the setting once you have begun your flight. No vessel in which this has been done has ever returned.

One of the orbiting cruisers had detected it and closed in on it. Now a tug was bringing it in to the Corporation's own docks, where usually only the rockets from the planets latched in. There was a hatch big enough to hold even a Five. This was a Three . . . what there was left of it.

"Oh, sweet Jesus," Sheri whispered. "Bob, what do you suppose happened to them?"

"To the people? They died." There was not really any doubt of that. The ship was a wreck. The lander stem was gone, just the interstellar vehicle itself, the mushroom cap, was still there, and that was bent out of shape, split open, seared by heat. Split open! Heechee metal, that doesn't even soften under an electric arc!

But we hadn't seen the worst of it.

We never did see the worst of it, we only heard about it. One man was still inside the ship. All over the inside of the ship. He had been literally spattered around the control room, and his remains had been baked onto the walls. By what? Heat and acceleration, no doubt. Perhaps he had found himself skipping into the upper reaches of a sun, or in tight orbit around a neutron star. The differential in gravity might have shredded ship and crew like that. But we never knew.

The other two persons in the crew were not there at all. Not that it was easy to tell; but the census of the organs revealed only one jaw, one pelvis, one spine—though in many short pieces. Perhaps the other two had been in the lander?

"Move it, fish!"

Sheri caught my arm and pulled me out of the way. Five uniformed crewmen from the cruisers came through, in American and Brazilian blue, Russian beige, Venusian work white and Chinese all-pupose

black-and-brown. The American and the Venusian were female; the faces were all different, but the expressions were all the same mixture of discipline and distaste.

"Let's go." Sheri tugged me away. She didn't want to watch the crewmen poke through the remnants, and neither did I. The whole class, Jimmy Chou, Klara and the other teachers and all, began to straggle back to our rooms. Not quite quick enough. We had been looking through the ports into the lock; when the patrol from the cruisers opened it, we got a whiff of the air inside. I don't know how to describe it. A little bit like overripe garbage being cooked to swill to pigs. Even in the rank air of Gateway, that was hard to take.

Teacher dropped off at her own level—down pretty low, in the high-rent district around Easy Level. When she looked up after me as I said good night I observed for the first time that she was crying.

Sheri and I said good night to the Forehands at their door, and I turned to her, but she was ahead of me.

"I think I'll sleep this one out," she said. "Sorry, Bob, but, you know, I just don't feel like it any more."

IX

I don't know why I keep going back to Sigfrid von Shrink. My appointment with him is always on a Wednesday afternoon, and he doesn't like it if I drink or dope before then. So it blows the whole day. I pay a lot for those days. You don't *know* what it costs to live the way I live. My apartment over Washington Square is eighteen thousand dollars a month. My residence taxes to live under the Big Bubble come to another three thousand plus. (It doesn't cost that much to stay on Gateway!) I've got some pretty hefty charge accounts for furs, wine, lingerie, jewelry, flowers . . . Sigfrid says I try to buy love. All right, I do. What's wrong with that? I can afford it. And that's not mentioning what Full Medical costs me.

Sigfrid, though, comes free. I'm covered by the Full Medical for psychiatric therapy, any variety I like; I could have Group Grope or internal massage for the same price, namely nothing. I kid him about that sometimes. "Even considering that you're just a bag of rusty bolts," I say, "you're not much good. But your price is right."

He asks, "Does that make you feel that you yourself are more valuable, if you say that I'm not?"

"Not particularly."

"Then why do you insist on reminding yourself that I'm a machine? Or that I don't cost anything? Or that I cannot transcend my programming?"

"I guess you just piss me off, Sigfrid." I know that won't satisfy him, so I explain it. "You ruined my morning. This friend, S. Ya. Lavorovna, stayed over last night. She's *something*." So I tell Sigfrid a little bit about what S. Ya. is like, including what she is like walking away from me in stretch pants with that long dirty-gold hair hanging down to her waist.

"She sounds very nice," Sigfrid comments.

"Bet your bolts. Only thing is, she wakes up slow in the morning. Just when she was getting lively again I had to leave my summer place, up over Tappan Sea, and come down here."

"Do you love her, Bob?"

The answer is no, so I want him to think it's yes. I say, "No."

"I think that's an honest answer, Rob," he says, approvingly, and disappointingly. "Is that why you're angry with me?"

"Oh, I don't know. Just in a bad mood, I guess."

"Can you think of any reasons why?"

He waits me out, so after a while I say, "Well, I took a licking at roulette last night."

"More than you can afford?"

"Christ! No." But it's annoying, all the same. There are other things, too. It's getting toward that chilly time of year. My place over Tappan Sea isn't under the Bubble, so sitting out on the porch with S. Ya. for brunch wasn't such a good idea. I don't want to mention this to Sigfrid. He would say something wholly rational like, well, why didn't I have my lunch served indoors? And I would just have to tell him all over again that when I was a kid it was my dream to own a summer place over Tappan Sea and have brunch on the porch, looking out over it. They'd just dammed the Hudson then, when I was about maybe twelve. I used to dream a lot about Making It Big and living in the style of The Rich Folks. Well, he's heard all that.

Sigfrid clears his throat. "Thank you, Bob," he says, to let me know that the hour is over. "Will I see you next week?"

"Don't you always?" I say, smiling. "How the time flies. Actually I wanted to leave a little early today."

"Did you, Bob?"

"I have another date with S. Ya.," I explain. "She's coming back up to the summer place with me tonight. Frankly, what she's going to do is better therapy than what you do."

He says, "Is that all you want out of a relationship, Robbie?"

"You mean, just sex?" The answer in this case is no, but I don't want him to know just what it is I do want out of my relationship with S. Ya. Lavorovna. I say, "She's a little different from most of my girl friends, Sigfrid. She has about as much clout as I do, for one thing. Has a damn good job. I admire her."

Well, I don't, particularly. Or rather, I don't care much about whether I admire her or not. S. Ya. has one trait that impresses me even more than possessing the sweetest rear view that God ever laid on a human female. Her damn good job is in information handling. She went to the Akademogorsk University, she was a fellow at the Max Planck Institute for Machine Intelligence and she teaches graduate students in the A.I. department at N.Y.U. She knows more about Sigfrid than Sigfrid knows about himself, and that suggests interesting possibilities to me.

X

Along about my fifth day on

Gateway I got up early and splurged, breakfast out in the Heecheetown Arms, surrounded by tourists, bloody-eyed gamblers from the casino across the spindle and liberty sailors from the cruisers. It felt luxurious, and cost luxurious too. It was worth it because of the tourists. I could feel their eyes on me. I knew they were talking about me, particularly a smooth-faced but old African type, Dahomeyan or Ghanaian, I think, with his very young, very plump, very jeweled wife. Or whatever. As far as they could tell, I was a swashbuckling hero. True, I didn't have any bangles on my arm, but some of the veterans didn't wear them either.

I basked. I considered ordering real eggs and bacon, but that was a little more than even my euphoria would let me go for, so I settled for orange juice (it turned out to be real, to my surprise) and a brioche and several cups of black Danish coffee. All I was really missing was a pretty girl across the armboard of the chair. There were two nice looking women who seemed to be the liberty crew from the Chinese cruiser, neither of them unwilling to exchange a few radio messages by the glance of the eyes, but I decided to keep them as open prospects for some future date and paid my check (that was painful enough) and left for class.

On the way down I caught up with the Forehands. The man, whose name seemed to be Sess, dropped off the down-cable and waited to wish me a polite good morning. "We didn't see you at breakfast," his wife mentioned, so I told them where I had been. The younger daughter, Lois, looked faintly envious. Her mother caught the expression and patted her. "Don't worry, hon. We'll eat there before we go back to Venus." To me: "We have to watch our pennies right now. But when we hit, we've got some pretty big plans for spending the profits."

"Don't we all," I said, but something was turning over in my head. "Are you really going to go back to Venus?"

"Certainly," they all said, in one way or another, and they acted surprised at the question. Which surprised me. I hadn't realized that tunnel rats could manage to think of that molten stinkpot as home. Sess Forehand must have read my expression, too. They were a reserved family, but they didn't miss much. He grinned and said:

"It's our home, after all. So is Gateway, in a way."

That was astonishing. "Actually, we're related to the first man to find Gateway, Sylvester Macklen. You've heard of him?"

"How could I not."

"He was a sort of a cousin. I guess you know the whole story?" I started to say I did, but he obviously was proud of his cousin, and I couldn't blame him, and so I heard a slightly different version of the familiar legend: "He was in one of the South Pole tunnels, and found a ship. God knows how he got it to the surface, but he did, and he got in and evidently squeezed the go-teat, and it went where it was programmed—here."

"Doesn't the Corporation pay a royalty?" I asked. "I mean, if they're going to pay for discoveries,

what discovery would be more worth paying for?"

"Not to us, anyway," said Louise Forehand, somewhat somberly; money was a hard subject with the Forehands. "Of course, Sylvester didn't set out to find Gateway. As you know from what we've been hearing in class, the ships have automatic return. Wherever you go, you just squeeze the go-teat and you come straight back here. Only that didn't help Sylvester, because he *was* here. It was the return leg of a round trip with about a zillion years stopover."

"He was smart and strong," Sess took up the story. "You have to be to explore. So he didn't panic. But by the time anybody came out here to investigate he was out of life-support. He could have lived a little longer. He could have used the lox and H-two from the lander tanks for air and water. I used to wonder why he didn't."

"Because he would have starved anyway," Louise cut in, defending her relative.

"I think so. Anyway, they found his body, with his notes in his hand. He had cut his throat."

They were nice people, but I had heard all this, and they were making me late for class.

Of course, class wasn't all that exciting just at that point. We were up to Hammock Slinging (Basic) and Toilet Flushing (Advanced). You may wonder why they didn't spend more time actually teaching us how to fly the ships. That's simple. The things flew themselves, as the Forehands, and everybody else, had been telling me. Even the landers were no sweat to operate, although they did require a hand on the controls. Once you were in the lander all you had to do was compare a three-D, sort of holographic representation of the immediate area of space with where you wanted to go, and maneuver a point of light in

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LAUNCH AVAILABILITIES

30–107. FIVE. Three vacancies, English–speaking. Terry Yakamora (ph 83–675) or Jay Parduk (83–004).

30–108. THREE. Armored. One vacancy, English or French.
BONUS TRIP. Dorlean Sugrue (P–phone 88–108).

30–109. ONE. Check trip. Good safety record. See Launch Captain.

30–110. ONE. Armored. BONUS TRIP. See Launch Captain.

30–111. THREE. Open enlistment. See Launch Captain.

30–112. THREE. Probable short trip. Open enlistment. Minimum guarantee. See Launch Captain.

30–113. ONE. Four vacancies via Gateway Two. Transportation in reliable Five.
Tikki Trumbull (ph 87–869.)

the tank to the point you wanted to reach. The lander went there. It calculated its own trajectories and corrected its own deviations. It took a little muscular coordination to get the hang of twisiting that point of light to where you wanted it to go, but it was a forgiving system.

Between the sessions of flushing practice and hammock drill we talked about what we were going to do when we graduated. The launch schedules were kept up to date and displayed on the PV monitor in our class whenever anyone pushed the button. Some of them had names attached to them, and one or two of the names I recognized. Tikki Trumbull was a girl I had danced with and sat next to in the mess hall once or twice. She was an out-pilot, and as she needed crew I thought of joining her. But the wiseheads told me that out-missions were a waste of time.

I should tell you what an out-pilot is. He's the guy who ferries fresh crews to Gateway Two. There are about a dozen Fives that do that as a regular run. They take four people out (which would be what Tikki wanted people for), and then the pilot comes back alone, or with returning prospectors—if any—and what they've found. Usually there's somebody.

The team who found Gateway Two are the ones we all dreamed about. They *made* it. Man, did they make it! Gateway Two was another Gateway, nothing more or less, except that it happened to orbit around another star than our own. There was not much more in the way of treasure on Gateway Two than there was on our own Gateway; the Heechee had swept everything pretty clean, except for the ships themselves. And there weren't nearly as many ships there, only about a hundred and fifty, compared to almost a thousand on our old original solar Gateway. But a hundred and fifty ships are worth finding all by themselves. Not to mention the fact that they accept some destinations that our local Gateway's ships don't appear to.

The ride out to Gateway Two seems to be about four hundred light-years, and takes a hundred and nine days each way. Two's principal star is a bright blue B-type. They think it is Alcyone in the Pleiades, but there is some doubt. Well, actually that's not Gateway Two's *real* star. It doesn't orbit the big one, but a little cinder of a red dwarf nearby. They say the dwarf is probably a distant binary with the blue B, but they also say it shouldn't be because of the difference in ages of the two stars. Give them a few more years to argue and they'll probably know. One wonders why the Heechee would have put their spacelines junction in orbit around so undistinguished a star, but one wonders a lot about the Heechee.

However, all that doesn't affect the pocketbook of the team who happened to find the place. They get a royalty on everything that any later prospector finds! I don't know what they've made so far, but it has to be in the tens of millions apiece. Maybe the hundreds. And that's why it doesn't pay to go with an out-pilot; you don't really have a much better chance of scoring, and you have to split what you get.

So we went down the list of upcoming launches and hashed them over in the light of our five-day expertise. Which wasn't much. We appealed to Gelle-Klara Moynlin for advice. After all, she'd been out twice. She studied the list of flights and names, pursing her lips. "Terry Yakamora's a decent guy," she said. "I don't know Parduk, but it might be worth taking a chance on that one. Lay off Dorean's flight. There's a million-dollar bonus, but what they don't tell you is that they've got a bastard control board in it. The Corporation's experts have put in a computer that's supposed to override the Heechee target selector, and I wouldn't trust it. And, of course, I wouldn't recommend a One in any circumstances."

Lois Forehand asked, "Which one would you take if it was up to you, Klara?"

She scowled thoughtfully, rubbing that dark left eyebrow with the tips of her fingers. "Maybe Terry. Well, any of them. But I'm not going out again for a while." I wanted to ask her why, but she turned away from the screen and said, "All right, gang, let's get back to the drill. Remember, up for pee, down, close, wait ten and up for poo."

* * *

I celebrated completing the week on ship-handling by offering to buy Dane Metchnikov a drink. That wasn't my first intention. My first intention had been to buy Sheri a drink and drink it in bed, but she was off somewhere. So I worked the buttons on the piezophone and got Metchnikov.

He sounded surprised at my offer. "Thanks," he said, and then considered. "Tell you what. Give me a hand carrying some stuff, and then I'll buy *you* a drink."

So I went down to his place, which was only one level below Baby; his room was not much better than my own, and bare, except for a couple of full carryalls. He looked at me almost friendlily. "You're a prospector now," he grunted.

"Not really. I've got two more courses."

"Well, this is the last you see of me, anyway. I'm shipping out with Terry Yakamora tomorrow."

I was surprised. "Didn't you just get back, like ten days ago?"

"You can't make any money hanging around here. All's I was waiting for was the right crew. You want to come to my farewell party? Terry's place. Twenty hundred."

"That sounds fine," I said. "Can I bring Sheri?"

"Oh, sure, she's coming anyway, I think. Buy you the drink there, if you don't mind. Give me a hand and we'll get this stuff stored."

He had accumulated a surprising amount of goods. I wondered how he had managed to stash them all away in a room as tiny as my own: three fabric carriers all stuffed full, holodisks and a viewer, book tapes and a few actual books. I took the carriers. On Earth they would have weighed more than I could handle, probably fifty or sixty kilos, but of course on Gateway lifting them was no problem, it was only tugging them through the corridors and jockeying them down the shafts that was tricky. I had the mass, but Metchnikov had the problems, since

what he was carrying was in odd shapes and varying degrees of fragility. It was about an hour's haul, acutally. We wound up in a part of the asteroid I'd never seen before, where an elderly Pakistani woman counted the pieces, gave Metchnikov a receipt and began dragging them away down a thickly vine-grown corridor.

"Whew," He grunted. "Well, thanks."

"You're welcome." We started back toward a dropshaft and he said, making coversation, I assume out of some recognition that he owed me a social favor and should practice some social skills:

"So how was the course?"

"You mean apart from the fact that I've just finished it and still don't have any idea how to fly those God-damned ships?"

"Well, of course you don't," he said, irritably. "The course isn't going to teach you that. It just gives you the general idea. The way you learn, you do it. Only hard part's the lander, of course. Anyway, you've got your issue of tapes?"

"Oh, yes." There were six cassettes of them. Each of us had been given a set when we completed the first week's course. They had everything that had been said, plus a lot of stuff about different kinds of controls that the Corporation might, or might not, fit on a Heechee board and so on.

"So play them over," he said. "If you've got any sense you'll take them with you when you ship out. Got plenty of time to play them then. Mostly the ships fly themselves anyway."

"They'd better," I said, doubting it. "So long." He waved and dropped onto the down-cable without looking back. Apparently I had agreed to take the drink he owed me at the party. Where it wouldn't cost him anything.

I thought of looking for Sheri again, and decided against it. I was in a part of Gateway I didn't know and of course I'd left my map back in my room. I drifted along, more or less at random, past star-points where some of the tunnels smelled musty and dusty and there weren't many people, then through an inhabited section that seemed to be mostly Eastern European. I didn't recognize the languages, but there were little notes and wall signs hanging from the everywhere-growing ivy that were in alphabets that looked Cyrillic or even stranger. I came to a drop-shaft, thought for a moment and then caught hold of the up cable. The easy way not to be lost on Gateway is to go up until you get to the spindle, where "up" ends.

But this time I found myself passing Central Park and, on impulse, dropped off the up cable to sit by a tree for a while.

Central Park isn't really a park. It's a large tunnel not far from the center of rotation of the asteroid which has been devoted to vegetation. I found orange trees there (which explained the juice) and grape vines; and ferns and mosses, but no grass. I am not sure why. Probably it has something to do with planting only varieties that are sensitive to the available light, mostly the blue gleam from the Heechee metal all around, and perhaps they couldn't find a grass

that could use it efficiently for its photochemistry. The principal reason for having Central Park in the first place was to suck up CO_2 and give back oxygen; that was before they spread planting all over the tunnels. But it also killed smells, or anyway it was supposed to, a little, and it grew a certain amount of food. The whole thing was maybe eighty meters long and twice as tall as I was. It was broad enough to have room for some winding paths. The stuff they grew in looked a lot like good old genuine Earthside dirt. What it was, really, was a humus made out of the sewage sludge from the couple of thousand people who had used Gateway toilets, but you couldn't tell that by looking at it, or by smelling it, either.

The first tree big enough to sit by was no good for that purpose; it was a mulberry, and under it were spread out sheets of fine netting to catch the dropping fruit. I walked past it, and down the path there were a woman and a child.

A child! I hadn't known there were any children on Gateway. She was a little bit of a thing, maybe a year and a half, playing with a ball so big, and so lazy in the light gravity, that it was like a balloon.

"Hello, Bob."

That was the other surprise; the woman who greeted me was Gelle-Klara Moynlin. I said without thinking, "I didn't know you had a little girl."

"I don't, This is Kathy Francis, and her mother lets me borrow her sometimes. Kathy, this is Bob Broadhead."

"Hello, Bob," the little thing called, studying me. "Are you a friend of Klara's?"

"I hope so. She's my teacher. Do you want to play catch?"

Kathy finished her study of me and said precisely, each word separate from the one before it but as clearly formed as an adult's, "I don't know how to play catch, but I will get six mulberries for you. That's all you can have."

"Thank you." I slumped down next to Klara, who was hugging her knees and watching the child. "She's cute."

"Well, I guess so. It's hard to judge, when there aren't very many other children around."

"She's not a prospector, is she?"

I wasn't exactly joking, but Klara laughed warmly. "Her parents are permanent party. Well, most of the time. Right now her mother's off prospecting; they do that sometimes, a lot of them. You can spend just so much time trying to figure out what the Heechee were up to before you want to try your own solutions to the puzzles."

"Sounds dangerous."

She shushed me. Kathy came back, with three of my mulberries in each open hand, so as not to crush them. She had a funny way of walking, which didn't seem to use much of the thigh and calf muscles; she sort of pushed herself up on the ball of each foot in turn, and let herself float to the next step. After I figured that out I tried it for myself, and it turned out to be a pretty efficient way of walking in near-zero gravity, but my reflexes kept lousing it up. I suppose you have to be born on Gateway to come by it naturally.

Klara in the park was a lot more relaxed and feminine than Klara the teacher. The eyebrows that had looked masculine and angry changed to looking outdoorsy and friendly. She still smelled very nice.

It was pretty pleasant, chatting with her, while Kathy stepped daintily around us, playing with her ball. We compared places we'd been, and didn't find any in common. The one thing we did find in common was that I was born almost the same day as her two-year-younger brother.

"Did you like your brother?" I asked, a gambit played for the hell of it.

"Well, sure. He was the baby. But he was an Aries, born under Mercury and the Moon. Made him fickle and moody, of course. I think he would have had a complicated life."

I was less interested in asking her about what happened to him than in asking if she really believed in that garbage, but that didn't seem tactful, and anyway she went on talking. "I'm a Saggitarius, myself. And you—oh, of course. You must be the same as Davie."

"I guess so," I said, being polite. "I, uh, don't go much for astrology."

"Not astrology, genethlialogy. One's supersition, the other's science."

"Um."

She laughed. "I can see you're a scoffer. Doesn't matter. If you believe, all right; if you don't—well, you don't have to believe in the law of gravity to get mashed when you fall off a two-hundred-story building."

This Park Is MONITORED By Closed-Circuit PV

You are welcome to enjoy it. Do not pick flowers or fruit. Do not damage any plant. While visiting, you may eat any fruits which have fallen, to the following limits:

Grapes, cherries 8 per person
Other small fruits or berries 6 per person
Oranges, limes, pears 1 per person

Gravel may not be removed from walks. Deposit all trash of any kind in receptacles.

Maintenance Division
The Gateway Corporation

Kathy, who had sat down beside us, inquired politely, "Are you having an argument?"

"Not really, honey." Klara stroked her head.

"That's good, Klara, because I have to go to the bathroom now and I don't think I can, here."

"It's time to go anyway. Nice to see you, Bob. Watch out for melancholy, hear?" And they went away hand in hand, Klara trying to copy the little girl's odd walk. Looking very nice . . . for a flake.

* * *

That night I took Sheri to Dane Metchnikov's going-away party. Klara was there, looking even nicer in a bare-midriff pants suit. "I

didn't know you knew Dane Metchnikov," I said.

"Which one is he? I mean, Terry's the one who invited me. Coming inside?"

The party had spilled out into the tunnel. I peered through the door and was surprised to find how much room there was inside; Terry Yakamora had two full rooms, both more than twice the size of mine. The bath was private and really did contain a bath, or at least a showerhead. "Nice place," I said admiringly, and then discovered from something another guest said that Klara lived right down the tunnel. That changed my opinion of Klara: if she could afford the high-rent district, why was she still on Gateway? Why wasn't she back home spending her money and having fun? Or contrariwise, if she was still on Gateway, why was she fooling around keeping barely even with the head tax by working as an assistant instructor, instead of going out for another killing? But I didn't get a chance to ask her. She did most of her dancing that night with Terry Yakamora and the others in the outgoing crew.

I lost track of Sheri until she came over to me after a slow, almost unmoving fox-trot, bringing her partner. He was a very young man—a boy, actually; he looked about nineteen. He looked familiar: dark skin, almost white hair, a wisp of a jaw-beard that drew an arc from sideburn to sideburn by way of the underside of his chin. He hadn't come up from Earth with me. He wasn't in our class. But I'd seen him somewhere.

Sheri introduced us. "Bob, you know Francesco Hereira?"

"I don't think so."

"He's from the Brazilian cruiser." Then I remembered. He was one of the inspectors who had gone in to fish through the baked gobbets of flesh on the shipwreck we'd seen a few days earlier. He was a torpedoman, according to his cuff stripes. They give the cruiser crews temporary duty as guards on Gateway, and sometimes they give them liberty there too. He'd come in in the regular rotation about the time we arrived. Somebody put on a tape for a hora just then, and after we were through dancing, a little out of breath, Hereira and I found ourselves leaning against the wall side by side, trying to stay out of the way of the rest of the party. I told him I had just remembered seeing him at the wreck.

"Ah, yes, Mr. Broadhead. I recall."

"Tough job," I said, for something to say. "Isn't it?"

He had been drinking enough to answer me, I guess. "Well, Mr. Broadhead," he said analytically, "the technical description of that part of my job is 'search and registry.' It is not always tough. For instance, in a short time you will no doubt go out, and when you come back I, or someone else in my job, will poke into your holes, Mr. Broadhead. I will turn out your pockets, and weigh and measure and photograph everything in your ship. That is to make sure you do not smuggle anything of value out of your vessel and off Gateway without paying the Corporation its due share. Then I register what I have found; if it is nothing, I write

'nil' on the form, and another crewman from another cruiser chosen at random does the same thing exactly. So you will have two of us prying into you.''

It didn't sound like a lot of fun for me, but not as bad as I had thought at first. I said so.

He flashed small, very white teeth. ''When the prospector to be searched is Sheri or Gelle-Klara over there, no, not bad at all. One can quite enjoy it. But I have not much interest in searching males, Mr. Broadhead. Especially when they are dead. Have you ever been in the presence of five human bodies that have been dead, but not embalmed, for three months? That was what it was like on the first ship I inspected. I do not think anything will be that bad ever again.''

Then Sheri came up and demanded him for another dance and

DUTY AND LEAVE ROSTER
USS MAYAGUEZ

1. Following O and crewpersons tr temp dy stns Gateway for contraband inspection and compliance patrol:

LINKY, Tina	W/o
MASKO, Casimir J	BsnM 1
MIRARCHI, Iory S	S2

2. Following O and crewpersons authd 24-hur temp dy Gateway for R&R:

GRYSON, Katie W	LtJG
HARVEY, Iwan	RadM
HLEB, Caryle T	S1
HOLL, William F Jr	S1

3. All O and crewpersons are cautioned once again to avoid any repeat any dispute with O and crewpersons of other patrol vessels regardless of nationality and regardless of circumstances, and to refrain from divulging classified information to any person whatsoever. Infractions will be dealt with by complete deprivation of Gateway leave in addition to such other punishments as a defaulter's court may direct.

4. Temporary duty on Gateway is a privilege, not a right. If you want it, you have to earn it.

By Command of the
CAPTAIN
USS MAYAGUEZ

the party went on.

There were a lot of parties. It turned out there always had been, it was just that we new fish hadn't been part of the network, but as we got nearer graduating we got to know more people. There were farewell parties. There were welcome-back parties, but not nearly as many. Even when crews did come back, there was not always any reason to celebrate. Sometimes they had been gone so long they had lost touch with all their friends. Sometimes, when they had hit fairly lucky, they didn't want anything but to get off Gateway on the way home. And sometimes, of course, they couldn't have a party because parties aren't permitted in the intensive care rooms at Terminal Hospital.

It wasn't all parites; we had to study. By the end of the course we were supposed to be fully expert in ship-handling, survival techniques and the appraisal of trade goods. Well, I wasn't. Sheri was even worse off than I. She took to the ship-handling all right, and she had a shrewd eye for detail that would help her a lot in appraising the worth of anything she might find on a prospecting trip. But she didn't seem able to get the survival course through her head.

Studying with her for the final examinations was misery:

"Okay," I'd tell her, "this one's a type F star with a planet with point-eight surface G, a partial pressure of oxygen of 130 millibars, mean temperature at the equator plus forty Celsius. So what do you wear to the party?"

She said accusingly, "You're giving me an easy one. That's practically Earth."

"So what's the answer, Sheri?"

She scratched reflectively under her breast. Then she shook her head impatiently. "Nothing. I mean, I wear an airsuit on the way down, but once I get to the surface I could walk around in a bikini."

"Shithead! You'd be maybe dead in twelve hours. Earth-normal conditions means there's a good chance of an Earth normal-type biology. Which means pathogens that could eat you up."

"So all right—" she hunched her shoulders—"so I'd keep the suit until, uh, I tested for pathogens."

"And how do you do that?"

"I use the fucking kit, stupid!" She added hastily, before I could say anything, "I mean I take the, let's see, the Basic Metabolism disks out of the freezer and activate them. I stay in orbit for twenty-four hours until they're ripe, then when I'm down on the surface I expose them and take readings with my, uh, with my C-44."

"C-33. There's no such thing as a C-44."

"So all right. Oh, and also I pack a set of antigen boosters, so if there's a marginal problem with some sort of microorganism I can give myself a booster shot and get temporary immunity."

I guess that's all right, so far," I said doubtfully. In practice, of course, she wouldn't need to remember all that. She would read the directions on the packages, or play her course tapes, or better still she would be out with somebody who had been out before and would know the ropes. But there was also

the chance that something unforeseen would go wrong and she would be on her own resources, not to mention the fact that she had a final test to take and pass. "What else, Sheri?"

"The usual, Bob! Do I have to run through the whole list? All right. Radio-relay; spare powerpack; the geology kit; ten-day food ration—and no, I don't eat anything I find on the planet at all, not even if there's a MacDonald's hamburger stand right next to the ship. And an extra lipstick and some sanitary napkins."

I waited. She smiled prettily, outwaiting me. "What about weapons?"

"Weapons?"

"Yes, God damn it! If it's nearly Earth normal, what are the chances of life being there?"

"Oh, yes. Let's see. Well, of course if I need them I take them. But, wait a minute, first I sniff for methane in the atmosphere with the spectrometer reading from orbit. If there's no methane signature there's no life, so I don't have to worry."

"There's no *mammalian* life, and you do have to worry. What about insects? Reptiles? Dluglatches?"

"Dluglatches?"

"A word I just made up to describe a kind of life we've never heard of that doesn't generate methane in its gut but eats people."

"Oh, sure. All right, I'll take a sidearm and twenty rounds of soft-nosed ammo. Give me another one."

And so we went on. When we first started rehearsing each other what we usually said at a point like that was either, "Well, I won't have to worry, because you'll be there with me anyway," or, "Kiss me, you fool." But we'd kind of stopped saying that.

In spite of it all, we graduated. All of us.

We gave ourselves a graduation party, Sheri and me, and all four of the Forehands, and the others who had come up from Earth with us and the six or seven who had appeared from one place or another. We didn't invite any outsiders, but our teachers weren't outsiders. They all showed up to wish us well. Klara came in late, drank a quick drink, kissed us all, male and female, even the Finnish kid with the language block who'd had to take all of his instruction on tapes. *He* was going to have a problem.

They have instruction tapes for every language you ever heard of; if they don't happen to have your exact dialect they run a set through the translating computer from the nearest analogue. That's enough to get you through the course, but after that the problem starts. You can't reasonably expect to be accepted by a crew that can't talk to you. His block kept him from learning any other language, and there was not a living soul on Gateway who spoke Finnish.

We took over the tunnel three doors in each direction past our own, Sheri's, the Forehands' and mine. We danced and sang until it was late enough for some of us to begin to drop off and then we dialed in the list of open launches on the PV screen. Full of beer and weed, we cut cards for first pick, and I won.

SHOWER PROCEDURE

This shower will automatically deliver two 45-second sprays. Soap between sprays.

You are entitled to 1 use of the shower in each 3-day period.

Additional showers may be charged against your credit balance at the rate of

45 seconds - $5

* * *

Something happened inside my head. I didn't sober up, really. That wasn't it. I was still feeling cheerful and sort of warm all over and open to all the personality signals that were coming in. But a part of my mind opened up and a pair of clear-seeing eyes peered out at the future and made a judgment. "Well," I said, "I guess I'll pass my chance right now. Sess, you're number two; you take your pick."

"Thirty-one oh nine," he said promptly; all the Forehands had made up their minds in family meeting, long since. "Thanks, Bob."

I gave him a carefree, drunken wave. He didn't really owe me anything. That was a One, and I wouldn't have taken it for any price. For that matter, there wasn't anything on the board I liked. I grinned at Klara and winked; she looked serious for a minute, then winked back, but still looked serious. I knew she realized what I had come to understand: all these launches were rejects. The best ones had been snapped up as soon as they were announced by returnees and permanent party.

Sheri had drawn fifth pick, and when it came her turn she looked directly at me. "I'm going to take that Three if I can fill it up. What about it, Bob? Are you going to come or not?"

I chuckled. "Sheri," I said, sweetly reasonable, "there's not a returnee that wants it. It's an armored job. You don't know *where* the hell it might be going. And there's a lot too much green in the guidance panel to suit me." (Nobody really knew what the colors meant, of course, but there was a superstition in the school that a lot of green meant a super-dangerous mission.)

"It's the only open Three, and there's a bonus."

"Not me, honey. Ask Klara; she's been around a long time and I respect her judgment."

"I'm asking you, Bob."

"No. I'll wait for something better."

"I'm not waiting, Bob. I already talked to Willa Forehand, and she's agreeable. If worst comes to worst we'll fill it out with—anybody at all," she said, looking at the Finnish kid, smiling drunkenly to himself as he stared at the launch board. "But—you and I did say we were going out together."

I shook my head.

"So stay here and rot," she flared.

"Your girl friend's just as scared as you are!"

Those sober eyes inside my skull looked at Klara, and the frozen, unmoving expression on her face; and, wonderingly, I realized Sheri was right. Klara was like me. We were both afraid to go.

XI

I say to Sigfrid, "This isn't going to be a very productive session, I'm afraid. I'm just plain exhausted. Sexually, if you know what I mean."

"I certainly do know what you mean, Bob."

"So I don't have much to talk about."

"Do you remember any dreams?"

I squirm on the couch. As it happens, I do remember one or two. I say, "No." Sigfrid is always after me to tell him my dreams. I don't like it.

When he first suggested it I told him I didn't dream very often. He said patiently, "I think you know, Bob, that everyone dreams. You may not remember the dreams in the waking state. But you can, if you try."

"No, I can't. You can. You're a machine."

"I know I'm a machine, Bob, but we're talking about you. Will you try an experiment?"

"Maybe."

"It isn't hard. Keep a pencil and a piece of paper beside your bed. As soon as you wake up, write down what you remember."

"But I don't ever remember anything at all about my dreams."

"I think it's worth a try, Bob."

Well, I did. And, you know, I actually did begin to remember my dreams. Little tiny fragments, at first. And I'd write them down, and sometimes I would tell them to Sigfrid and they would make him as

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1316 ,S, It's very healthy that you
     view your breakup                                  115,215
     with Drusilla as a learning ex-
     perience, Bob.                                     115,220
1318 ,C, I'm a very healthy person,
     Sigfrid, that's                                    115,225
     why I'm here.                                      115,230

1319 IRRAY (DE) = IRRAY (DF)                            115,235

1320 ,C, Anyway, that's what life is, just one
     learning                                           115,240
     experience after another, and when
     you're through                                     115,245
     with all the learning experiences you
     graduate and                                       115,250
     what you get for a diploma is, you die.            115,255
```

happy as anything. He just loved dreams.

Me, I didn't see much use in it. . . . Well, not at first. But then something happened that made a Christian out of me.

One morning I woke up out of a dream that was so unpleasant and so real that for a few moments I wasn't sure it wasn't actual fact, and so awful that I didn't dare let myself believe it was only a dream. It shook me so much that I began to write it down, as fast as I could, every bit I could remember. Then there was a P-phone call. I answered it; and, do you know, in just the minute I was on the phone, I forgot the whole thing! Couldn't remember one bit of it. Until I looked at what I had written down, and then it all came back to me.

Well, when I saw Sigfrid a day or two later, I'd forgotten it again! As though it had never happened. But I had saved the piece of paper, and I had to read it to him. That was one of the times when I thought he was most pleased with himself and with me, too. He worried over that dream for the whole hour. He found symbols and meanings in every bit of it. I don't remember what they were, but I remember that for me it wasn't any fun at all.

As a matter of fact, do you know what's really funny? I threw away the paper on the way out of his office. And now I couldn't tell you what that dream was to save my life.

"I see you don't want to talk about dreams," says Sigfrid. "Is there anything you do want to talk about?"

"Not really."

He doesn't answer for a moment, and I know he is just biding his time to outwait me so that I will say something, I don't know, something foolish. So I say, "Can I ask you a question, Sigfrid?"

"Can't you always, Rob?" Sometimes I think he's actually trying to smile. I mean, really smile. His voice sounds like it.

"Well, what do you do with all the things I tell you?"

"I'm not sure I understand the question, Robbie. If you're asking what the information storage program is, the answer is quite technical."

"No, that's not what I mean." I hesitate, trying to make sure what the question is, and wondering why I want to ask it. I guess it all goes back to Sylvia, who was a lapsed Catholic. I really envied her her church, and let her know I thought she was dumb to have left it, because I envied her the confession. The inside of my head was littered with all these doubts and fears that I couldn't get rid of. I would have loved to unload them on the parish priest. I could see that you could make quite a nice hierarchical flow pattern, with all the shit from inside my own head flushing into the confessional, where the parish priest flushes it onto the diocesan monsignor (or whoever; I don't really know much about the Church), and it all winds up with the Pope, who is the settling tank for all the world's sludge of pain and misery and guilt, until he passes it on by transmitting it direct to God. (I mean, assuming the existence of a God, or at least assuming that there is an address called "God" to

which you can sent the shit.)

Anyway, the point is that I sort of had a vision of the same system in psychotherapy: local drains going into branch sewers going into community trunk lines treeing out of flesh and blood psychiatrists, if you see what I mean. If Sigfrid were a real person, he wouldn't be able to hold all the misery that's poured into him. He would have his own problems, to begin with. He would have mine, because that's how I would get rid of them, by unloading them onto him. He would also have those of all the other unloaders who share the hot couch; and he would unload all that, because he had to, onto the next man up, who shrank *him*, and so on and so on until they got to—who? The ghost of Sigmund Freud?

But Sigfrid isn't real. He's a machine. He can't feel pain. So where does all that pain and slime *go*?

I tried to explain all that to him, ending with: "Don't you see, Sigfrid? If I give you my pain and you give it to someone else, it has to end somewhere. It doesn't feel real to me that it just winds up as magnetic bubbles in a piece of quartz that nobody ever *feels*."

"I don't think it's profitable to discuss the nature of pain with you, Rob."

"Is it profitable to discuss whether you're real or not?"

He almost sighs. "Bob," he says, "I don't think it's profitable to discuss the nature of reality with you, either. I know I'm a machine. You know I'm a machine. What is the purpose in our being here? Are we here to help me?"

"I sometimes wonder," I say, sulking.

"I don't think you actually wonder about that. I think you know that you are here to help *you*, and the way to do it is by trying to make something happen inside *you*. What I do with the information may be interesting to your curiosity, and it may also provide you with an excuse to spend these sessions on intellectual conversation instead of therapy—"

"Touché, Sigfrid," I interrupt.

"Yes. But it is what you do with it that makes the difference in how you feel, and whether you function somewhat better or somewhat worse in situations that are important to you. Please concern yourself with the inside of your own head, Bob, not mine."

I say admiringly, "You sure are one fucking intelligent machine, Sigfrid."

He says, "I have the impression that what you're actually saying there is, 'I hate your fucking guts, Sigfrid.' "

I have never heard him say anything like that before, and it takes me aback, until I remember that as a matter of fact I have said exactly that to him, not once but quite a few times. And that it's true.

I do hate his guts.

He is trying to help me, and I hate him for it very much. I think about sweet, sexy S. Ya. and how willing she is to do anything I ask her, pretty nearly. I want, a lot, to make Sigfrid *hurt*.

TO BE CONTINUED

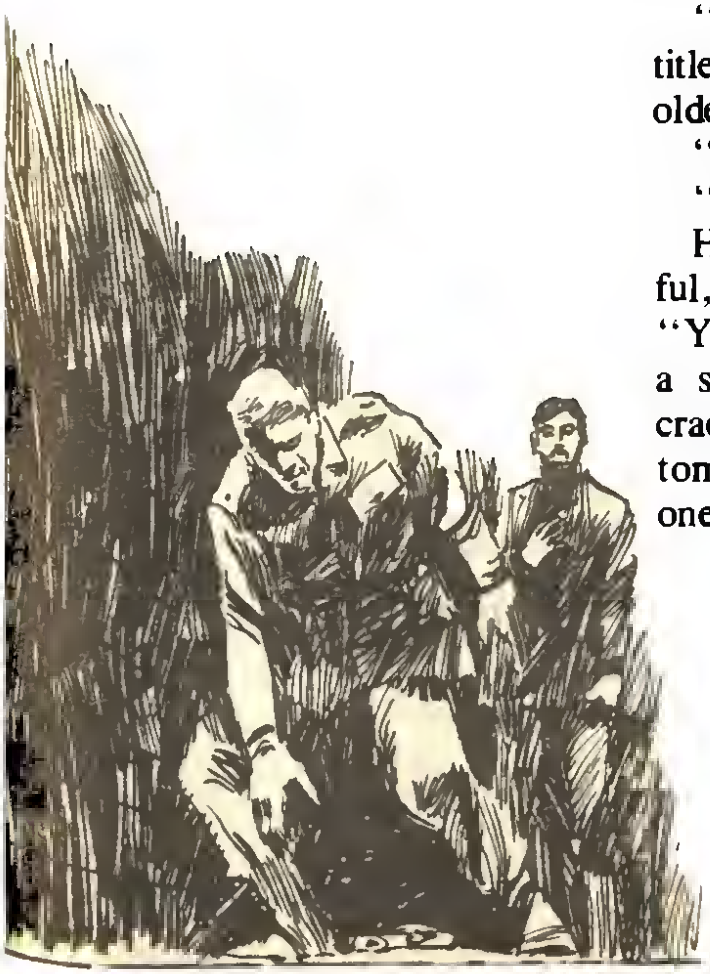
* * *



IN XANADU

Kevin O'Donnell, Jr.

A true ideologue will do anything—*anything!*—for the sake of principle. . .



THE BLEACHED SKULL rolled down the broken steps, leaving droppings of dust-dry bone on the pitted concrete. At the bottom the gritty wind caught it up and bowled it into a patch of tall coarse grass. George Willits forced himself to watch it go, restrained his impulse to retrieve and protect it. It was litter.

Rubbing his biceps with his left hand, he tried to massage away the pain. It didn't work; when he lifted his fingers, the skin was puffy and red. "Which way?" he asked.

The old woman pointed to the top of the broad staircase. "Up there, in the Great Hall." The wind, tugging strands of her grey hair loose, flailed her leathery skin with them. She seemed not to mind.

"Thank you, Grandmother." The title amused him; she wasn't much older than he was.

"He won't see you, you know."

"Why not?"

Her black eyes, bright and watchful, were as emotionless as a bird's. "You're a foreign devil." That was a statement, not an insult. Her cracked voice was obviously accustomed to using the two words as one.

"We'll see what he says. Will you come?"

"No." She glanced at his impassive features, brushed dust off her quilted jacket, and went on: "I am old, and poor, and have no time for the Helmsman. I must return at once, because the worthless wife of my oldest son will spoil the soup if I am not there to correct her. Please allow me to go."

He waved a hand, and one of the expedition's cameramen sprinted across the rubble-strewn plaza. A smile creased his chapped lips. The deference they paid him was flattering, even if he was too set in his ways to get conceited about it. "Take Mrs. Liang back to her farm," he instructed.

"Yes, professor."

"And—" Could he ignore the problem for a little while longer? No. He had to bring it to a head. "—ask Dr. Faroud to come over here, please."

"Right away, sir." The cameraman turned to the old lady, offered her his arm. She spurned his Western politeness by tucking her hands inside her embroidered sleeves. She bowed, he bowed, all three of them bowed. Then she followed him back to the jeep.

Small things crunched under Willits' boots as he shifted to face the top of the steps. His shadow sprawled shapelessly across the uneven cement; it was knife-edged from the glare of the sun in the wide blue sky.

Why hadn't the city burned? New York, Chicago, St. Louis, San Francisco: all were ashy wastelands of tumbled masonry and rusting girderworks. Few cities anywhere in the world had been spared. Those where governments had still functioned during the time of the riots had simply postponed their incineration; the arsonists had returned later, when there was no one to quench their ardor.

What was so special about Hsiang-t'an? Peking had gone up; so had Shanghai and Canton. The mausoleum's role could be worth studying. If it had helped to spare this place from the torches, the off-world city builders should be told of it. They needed every fragment of knowledge about urban behavior they could get. Evacuation to the countryside is not a viable alternative on Mars.

Behind him, a Matsushita Medical Corp. van picked its silent way through the piles of debris on the square. Its weight alarmed the wildlife: birds beat their way up into the clean air; rats scampered to safer hideouts. Somewhere in the twisting alleys a dog barked.

Willits stooped to peer through the windowed door. Faroud was at the wheel, his open-necked cotton shirt a brilliant dazzle in the otherwise dim interior.

"Why the summons, George?" He got out on his side and strolled around the front of the van. He was short, and sinewy-lean. Impatient

intelligence sparked in his Mediterranean eyes. "Have you found something *else* you can't deal with?"

Ignore the insult; keep him off guard. Straightening, he gestured to the granite facade of the building above the staircase. "An old lady said the mausoleum was up there."

"Rather asinine to be looking for the Chairman's body, isn't it?"

"It would be if I were, but I'm not. Anyway, there are four other mausoleums elsewhere in the country."

"Then—"

"Tell me about the health of the locals." Absently, he stroked his arm. It felt old, and weary. For a moment he envied the other his youth.

Faroud frowned, spread his handkerchief on a relatively smooth step, and sat. With his thumb he pushed up the brim of his cap. "The computer analysis is hardly complete, George—after all, we've only been here a week—and moreover, I'm not terribly certain that the histories we've obtained are quite accurate. Illiteracy, among other things, is so rampant that—"

"So tell me what you know, Gemal." The man would hedge all day if you let him.

"Well." He twisted the corner of his mustache as he thought. "The death rate is, of course, absurdly high. Quite in line with the predictions you made in Tokyo," he added almost ruefully. "This is attributable only in part to the rudimentary health care these peasants practice—I say, George, they not only live like animals, they *enjoy* it! One would suppose another factor to be responsible for the rest."

"Plague?"

Faroud scratched his ear. "You're obsessed with that, aren't you, George? All I can say is we've found no evidence of it in the blood samples we've obtained. And yet . . ." He spread his hands as though appealing to Allah. "And yet the rate is too high."

Give the man the last benefit of the doubt. "Anything else?"

"If there were, I would have mentioned it."

Putting his left foot on a higher step, he rested his forearms on his bent knee. Except for the birds, the city was motionless. There was sunlight, and there was wind. The one moved too gradually, the other, too invisibly. He sensed his kinship with the weather-beaten signboards, and the few scraps of paint still clinging stubbornly to the buildings around the square. "I'm afraid, Gemal."

"Don't be childish." His tone was contemptuous. "You've been inoculated against the plague."

"That's not what I'm afraid of, although it does bother me that it hasn't died out here." Maybe the arsonists had understood what they were doing. A city that's merely deserted echoes with ghostly

footsteps. You keep expecting the shrill blast of a police whistle to signal that the daily rhythms should be resumed. When the buildings are blackened with soot, though, when scraggly weeds grow in the wind-blown ash, then you know it's all over. "Why *is* it still cropping up?"

"Re-infection," shrugged Faroud. "These peasants have no concept of hygiene."

"I don't buy it." Stretching, he raised his face to the empty sky. The sun felt good on his tired skin. "Everywhere else, it mutated into harmlessness after what, twenty, twenty-five years?"

"You should know, you're the historian."

"Well, why not here? It's been a hundred and seventy years since it first broke out—why is it still virulent?"

"Perhaps it's not, perhaps it merely weakens them to the point where something else kills them off." He stood. After retrieving his handkerchief, he snapped it in the wind, then stuffed it into his hip pocket. "But honestly, George—who cares? It's their problem, and I say let them worry about it."

"*I* care, Gemal." He forced down the anger that Faroud's words had awakened. It was infuriating to find anti-sinicism in a well-educated man, but it couldn't be dealt with on an emotional level. Only reason could make Faroud see that the riddle of China's vulnerability could have overwhelming significance. "We need to know why the virus never died out."

"Random chance," Faroud bit off. "Also known as poetic justice."

"Maybe." He didn't believe it, though. The rest of the world had lost a quarter of its population during the plague years, yet had managed to recover. Even the urbanized West and its intricate technology had pulled through. Why not China? Mao had shaped his society to survive anything, up to and including nuclear warfare. He'd decentralized it, made each communal village as self-supporting as possible. They shouldn't have been hit so hard, unless . . . "Gemal—"

"Yes?"

He stared at the liver spots on the back of his hand. "Why the hatred?"

"Why not? Do you know where we'd be if the Chinese hadn't been so damned careless with their CBW research? They set us back a hundred years." He seemed to catch himself, as if he realized that he was giving away too much. "I do apologize, George. You know my feelings about this expedition, about how we're wasting a fortune that could be better used somewhere else. I'm afraid I let my emotions run away with me."

"I accept your apology," said Willits stiffly. Until that moment, he had been seeking a way to convince Faroud that the project was

worthwhile, but he knew now he wouldn't find one. Like too many others, Faroud held a grudge against the Chinese, and wanted to see them rot in unbroken solitude. "Back to the subject," he said. The rest of their discussion would have to be held indoors, away from prying eyes. "Why did it happen the way it did?"

"You know it's too soon to answer that. Wait for the specialists."

"Mm." There were a thousand of them scattered across the length and breadth of China, examining peasants, taping oral histories, digging through musty archives . . . exhuming bodies. Each would make a report (white copy to the sponsoring corporation, green to the section leader, canary to the expedition leader, pink for personal reference), and another batch of specialists would sift through them in search of the truth. A gigantic jig-saw puzzle, paid for by the companies that had supplanted the old governments. No VP R&D wanted a repetition of the Great Plague. Things like that wreaked havoc with P&L sheets. "It doesn't make sense," he muttered.

"Of course it doesn't." At his arrogant ease again, Faroud grinned: a blaze of white in a field of olive. "That's why solving this problem will make us all famous, eh, George? Now, unless you want me to inspect this mausoleum of yours, I have work to do."

"Not mine, it's Mao's."

"Of course." He mounted the steps slowly, as if in concession to Willits' years. "What about it so intrigues you—its age? Its ironic symbolism? Come, tell me. I'm always amused by the way an historian views things."

"I'm not sure." He looked up in time to see a flight of dirty-grey pigeons burst out of the building. "The city wasn't destroyed, for one thing. Was it because of the mausoleum? I mean, some sort of reversion to ancestor worship? Or is there no relation at all?" Dust grated beneath his ribbed soles. "The old lady told me people used to come here pretty regularly, up until about ten years ago."

"Rather stupid of them to persist that long. Why did they stop?"

"She was a little vague about that, but it seems that the building wouldn't let them in any more."

Faroud did a double-take. "I beg your pardon?"

"In the library at Iowa State, I found an old article on these things." He nodded to the two-story structure that lay before them. "There's a main viewing room—" Faroud's expression caused him to break off and explain: "Pictures and memorabilia, but no body."

"I see."

"Anyway, around the main viewing rooms are meditation rooms. Entrance to them is—was—regulated by some sort of computer. According to the writer, it was very democratic: you had to state your

occupation before the doors would open, but if too many people from your profession had already used the room, you couldn't enter."

"Strange."

"Mm." They were stepping through the broad entranceway; the marble floor was thickly coated with pigeon shit. He wrinkled his nose. "Anyway, the only people left around here are farmers, and the doors won't open any more."

"But they did until ten years ago?" asked Faroud.

"That's what she said—oh, you're wondering about the electricity? Don't. This place is hooked up to that damn solar power plant that's got the engineers so confused. You know, the one that should have broken down a hundred years ago, but didn't."

"I see." The building was cool, and damp. Glass display cases made a circular wall in the middle of the hall. Dust blanketed them.

"Gloomy."

"One shouldn't disparage one's metier, George."

The ceiling was lost in shadows; the walls were stained with rust and dirt and dung. Their voices hung in the still air like lazy balloons. After a moment or two, self-consciousness pushed them into whisper. It seemed more natural.

"How can you be at all interested in this dingy museum?" asked Faroud, exasperated.

"I'm not, really."

"The meditation rooms?"

"Yes." He swiveled his head until he'd found the staircase. "Over there."

"What on earth are you looking for?"

"I don't really know." That was a bare-faced lie. He'd had his mind made up for years. He was positive he knew what lay behind the computer-controlled doors, and all he had to do was get past them. But his theory wasn't the kind that could have been presented to skeptical scientists, not without proof. It wasn't that they'd have laughed—though they would have—it was that the sponsoring corporations would have retracted their support if they'd had any notion of his suspicions.

"So what shall we do first?"

* * *

"First?" He scanned the quotations engraved in the walls. Some were familiar; others had to be translated before he could see that they were just what he'd been expecting. "First," he said, sighing as he dropped all pretense of affability, "let's talk about a dream I had."

"A dream?" Faroud's voice was as startled as he'd ever heard it. No matter how incompetent, it seemed to be saying, expedition leaders did not mention such things in public. "What the devil do you mean, George?"

"I had a dream last night, Gemal." He walked over to a dis-

play case, and wiped a spot bare with the side of his hand. A faded battleflag was dimly visible. "I was in a prison cell, shackled to the wall. I couldn't move. My enemies were suffocating me, and I didn't know why. While they were stuffing my mouth with cotton, good fluffy Egyptian cotton, they were doing something to my arm. I didn't understand that, either."

"Are you hoping that I'll play Joseph to your Pharaoh? Because if so—"

"Not at all, Gemal," He turned, and with almost an apologetic air showed the other the small automatic he was holding. "I'd like to know," he said softly, "what you injected me with."

"George, are you—"

Like clouds moving away from the sun, the fingers of his other hand parted. In the palm of his hand glittered a gold cufflink. "It's yours, Gemal. I found it in my sleeping bag. And I've noticed your habit of rolling your sleeves before giving a shot. Now, will you tell me?"

"You're mad! Why should I—"

"I'd like to know that, too." The muzzle of the gun was steady. "You have five seconds. Four. Three. T—"

"Wait." He gulped, and wiped the sudden sweat off his forehead. His eyes, bleak obsidian, swept the room quickly, back and forth, searching for an exit. There was only the one. "I did do it."



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"What was it?"

"A—a flu virus. Nothing serious. Just something to, ah, put you out of action for a while, don't you know?" Dark stains were spreading under the arms of his shirt.

"Why?"

Faroud's jaw stiffened; he breathed rapidly for a long minute. A flush—of embarrassment? of anger?—rose in his neck and cheeks. "You're old, George," he said at last. "Too old. This is a job for a younger man."

"You mean like yourself?"

"Yes, like me, if you will. After all, you're not even a doctor—you're what, a history teacher? An amateur archeologist? You're unqualified to conduct this expedition. And then your ideas—my God, man, you've not changed them in decades! They've become as fossilized as those idiotic dinosaur tracks you keep looking for."

"I see." An old story. The youthful deputy, impatient for more renown, in disagreement with his superior . . . and well aware of how many years would pass before he could legitimately succeed to the throne. "So you thought that if I got sick, you'd take over as Acting Director, and impress hell out of the sponsors, right? And then they'd give you money for your own pet projects."

"Precisely."

Faroud was still trying to lie. A case of flu would put him in bed for a couple weeks, but hardly incapacitate him. The expedition, moreover, was open-ended: it would stay in the field until the sponsors had no more questions it could answer. It wasn't harmless flu virus coursing through his veins. Not a chance.

He wondered how long he'd have. If it was plague, as he more than half suspected, the inoculation he'd gotten in the States would give him some protection, though possibly not enough to survive the disease's complications. If it was something else—and Faroud, as Chief Medical Officer of the expedition could have gotten his hands on almost any type of virus . . . his stomach twisted; Faroud himself had given him his inoculation. And the Egyptian was one who believed in long-term planning.

The hell of it was, he could sympathize. Faroud was a research physician, not a historian. It was natural that he'd be most interested in physical diseases which his discipline hadn't conquered yet. The problem was that Willits was on the trail of another, subtler affliction . . . one that Faroud wouldn't recognize. Maybe he *couldn't* recognize it. Maybe he was too close to it.

Ironic. If Faroud hadn't launched his little palace revolution, Willits would have had time to go about his investigations properly. Now it was too late for SOP; he had to rush things along so that he could prove his point in the weeks—days?—left to him. Another irony:

Faroud would get his fame, but only because he'd be evidence.

Dammit, why didn't more people care about the truth? They were ready to assign blame, and to squeeze out their petty revenge, before they knew at whom the finger should be pointed. They didn't even want to know the true nature of the crime, and that was dangerous.

Mankind was back on its feet, and plunging into its technological future, but it didn't have the self-knowledge that it needed. Yet without that, understanding is impossible. Every perception is distorted by the prisms of our assumptions, and it behooves us to know the angles of refraction.

If you don't want to know what man *has* done, you can hardly protect yourself from what he *might* do.

"Let's go upstairs," he said, motioning with the gun.

"Why? Faroud looked ready to refuse.

"I'm going because I'd like to satisfy my curiosity," he replied. "You're going because I'll gutshoot you if you don't."

"George!" He did his best to appear shocked by such ruthlessness.

"Move."

Faroud obeyed. Willits stayed five paces behind him, the gun leveled at his sweat-stained back. Halfway up the stairs, he started speaking:

"You're not the first to feel stymied by old fogeys. The man who built this place would have had a lot of sympathy for you. He spent the last thirty years of his life trying to solve the problem."

"Mao?"

His tone was one of disbelief; he even ventured to glance back over his shoulder to see if his captor was serious. "But he *was* an old fogey."

"To you, yes, and possibly to some in his bureaucracy. To himself, though, he was the steward of perpetual revolution—look at his reign. As soon as one of his heirs got comfortable, he was ousted, and a new man brought in so the process could begin again. Do you read Chinese?"

"No." Left unasked was the question, *Why are you wasting my time?*

"Too bad. You would have enjoyed some of the quotations in the lobby. 'Guard against arrogance.' 'Commandism is wrong in any type of work.' 'We must never relax our vigilance.' 'It is necessary to carry on constant and arduous socialist revolutionary struggles.' And the one up here—" his eyes went to the huge characters carved into the wall "—'Where the broom does not reach, the dust will not vanish of itself.' Clever."

"What are you talking about?"

"This whole building, Gemal, is a monument to one man's impatience with a ponderous, entrenched bureaucracy. He knew what would happen, once he was gone and

couldn't keep things stirred up. He built this, and four others just like it, to make sure all his people would remain good little revolutionaries.'' He pointed to a door. Set in the wall beside it was a speaker and a microphone. ''Let's try this one here.''

''George.'' Faroud cleared his throat, and fought for self-control. Ease and elegance reappeared on his face, only slightly belied by his nervous eyes. ''I say, George, the flu must have taken hold. You're babbling, man!''

''Uh-uh.'' He came forward. ''Step up to that door.''

''And then?''

''When it opens, you go in. You'll have a chat with the Chairman himself, courtesy of some marvelous computers and a power plant that should have failed a hundred years ago. Too bad you don't speak Chinese.''

''But why?'' He moved closer to the steel-clad door anyway.

A new voice entered the quarrel, one crackly with years of accumulated static. ''What is your occupation, comrade?'' it asked in Chinese.

''I am a cadre,'' Willits answered, silencing Faroud with a glance.

''Then enter.'' The door slid back; stale dry air blew out of the darkness. The doctor hesitated.

''Get in there,'' he commanded.

''George—''

''Now!'' His trigger finger tightened visibly.

''All right.''

The door hissed shut behind him. Faintly, Willits could hear that the hissing continued even after the door had shut . . . it was gentler than it had any right to be.

The gun clattered to the floor. Willits looked at it, and saw where their footsteps had disturbed the grime. Underneath, the marble was worn. Thousands of feet had passed through that corridor in the years before something went wrong.

''I'm right, aren't I?'' he asked softly. The huge oil portrait of the Chairman lay still beneath its dust. ''Something went wrong. Not even you could have wanted it to be that lethal. What were you hoping for? A one-percent rise in the death rate? Two?'' He kicked the gun; as it skidded down the corridor, it laid bare a streak of delicate rose. ''You just wanted a little more ferment in the bureaucracy, didn't you? But something must have mutated, and the bureaucrat who was running this place didn't notice. Helluva thing. You thought the whole problem was that people wouldn't give up their positions or their power . . . so instead of creating more, you decided to take it from them.''

He went to get the gun. He'd need it for restraining Faroud until the two of them could be quarantined and decontaminated.

There was a mottled white crust over everything, and it crackled under his feet like powdered glass. ★

science fact:

A Step Farther Out



Jerry Pournelle, PhD

CRASHING NEUTRON STARS, MINI BLACK HOLES AND SPACEDRIVES

THE UNIVERSE is a queer place. I know that doesn't surprise my readers, so this month let's look at some far-out theories before the relentless march of science catches up and converts them into (yawn) just more engineering.

There's also a point to be made. At least once a week I get a new "theory" from one of my readers. Sometimes it's blueprints for a device that gives out more energy than it takes in, sometimes it's a refutation of Einstein, sometimes something else, but in nearly every case there's a common factor: the cover letter says no one will *listen,* and I'm the inventor's last resort. Generally, too, I'm asked "Why won't they listen?", but the question is rhetorical; the next paragraph tells me that orthodox scientists do not have open minds, are afraid of new ideas, etc., etc.

There's a little truth to that, but not so much as is often supposed. Orthodox science can get pretty far out, as we'll see in a moment.

Everyone knows what a neutron star is, right? It's a sort of intermediary superheavy object: that is, squeeze atoms hard enough but not too hard and they'll form a superdense goop. Everything has been shoved together, but it's still ordinary matter. That's what dwarf stars are made of.

Squeeze more and the atoms can't stand it. The electrons are forced out of their orbits and down into the nucleus. When you push an electron hard into a proton you get a neutron, and a sufficiently squeezed object will be nothing *but* neutrons, ie, a neutron star.

Finally we can continue squeezing (the "easy" way is to pump more and more matter onto a neutron star and let gravitational collapse do the work) and the very neutrons can't stand it: they're squeezed right out of the universe.

Well, maybe not: but the result is a black hole, an object whose surface gravity is greater than the speed of light so that it can never be observed, and that's a very queer thing indeed. For further details consult some of my previous columns, or there are any number of recent books.

Surely those theories are far out? And for a very long time they were pure theory. Back in the 30's J. Robert Oppenheimer deduced the possibility of neutron stars from an analysis of Einstein's work on gravitation. He also noted (as had others) the possibility of black holes. He published these speculations. No one laughed. He wasn't thrown out of the union. Why? Why did "they" listen to him, but "they" won't pay attention to outsiders?

Well, of course there is a certain degree of old-boy net working here; obviously you pay more attention to people you know or have heard of than people you don't know and who don't seem to have any qualifications; but that's not the whole of it by a long shot. Neutron stars and black holes were far out and queer indeed—*but they did not challenge basic physics*. Quite the contrary: they were deduced from accepted ideas.

Meanwhile, back in the observatories, the radio astronomers came up with a queer result: pulsars. These were very small objects which emitted quite a lot of energy at fantastically regular intervals on the order of a second. They were entirely unexpected: no theory predicted them, no theory accounted for them, yet they had to be explained. And of course explained they were, because it's easy to show that neutron stars will rotate very rapidly; they can send out bursts of radio energy, and even better, they'll be slowing down (very slightly) all the time. Back to the observatory to discover that the pulsars were slowing down at just the right rate (micro-seconds a year) and lo, Oppenheimer's far-out theory becomes universally acceptable.

That took care of neutron stars: and if *those* probably existed, then why not black holes? Thus the sudden interest in holes.

Now there are several ways we can create black holes. The simplest is for a properly-sized star to "go out": that is, the star runs out of fuel and begins to collapse from simple gravitational attraction. Of course the collapsing process will itself produce heat for quite a long time, and that brings us to another far-out theory: has the Sun, *our* Sun, "gone out"?

It may have. If it had we wouldn't notice, because it would only have to shrink a few kilometers a year to give off the energy it does. (Gravitational potential energy is *powerful* stuff.) Moreover, the continued collapse would eventually cause it to re-ignite, halting the col-

lapse. There are a very few theorists who seriously propose this alternation between collapse and hydrogen-burning as an explanation for Earth's Ice Ages. The theory is not widely held, but those who propose it aren't laughed at. Why not?

Well, first, the Ice Ages are real, and we don't have a convincing mechanism to explain them. Second, out in the old Homestake Mine, deep underground, they're searching for solar neutrinos—and they can't find them. If the Sun is truly burning hydrogen, there ought to be a lot of neutrinos, and there's no good reason to doubt that the Homestake apparatus would trap them—so where are they? The "Sun's gone out" theory does explain an experimental result.

Leaving that particular theory let's get back to black holes. There are other ways they might be formed. One would be to focus a laser small enough. After all, e equals mc-squared works both ways: if matter can become energy, energy can become matter, and thus a sufficient energy density would make a black hole. There'd be no way to tell it from other holes, either. This is not a very practical way to get black holes.

Finally, we can make black holes by having really humungous pressures. Stephen Hawking of Cambridge first postulated the idea of mini-black-holes, little tiny things massing from a few to a few million kilograms; previous to Hawking's work nobody contemplated a black hole smaller than stellar size.

Hawking thought that mini black holes had been formed during the Big Bang, when there were certainly sufficient pressures for creating them. Since it was then thought that black holes never go away once formed, we could expect in a few decades to go looking for primordial black holes in the asteroid belt.

Matter of fact, my friend Larry Niven won a Hugo for a mini-hole story. ("The Hole Man".) However, having created mini-holes, Hawking then proceeded to destroy them. He applied quantum mechanics to black holes and demonstrated that the things aren't stable. Black holes evaporate, small ones doing so rather quickly and quite violently. For details on *that,* see this column in the January 1975 GALAXY. I'm particularly proud of that column because it was the first popular-press publication of Hawking's evaporation theory; now his view is universally accepted.

The upshot was that holes massing less than 10^{15} grams when formed during the Big Bang are all gone now, and any larger holes formed then (and now getting down to small size) will vanish spectacularly with much high-temperature radiation. Consequently, we needn't bother looking for small black holes.

Well, guess what? Mini-holes are back again. Kenneth Jacobs and Patrick Seitzer have just published a

prize-winning essay submitted to the Gravity Research Foundation (for a copy of their paper send a couple of dollars to the GRF at 58 Middle St., Gloucester, Mass 01930) entitled "Mini Black Holes Are Forming Now." According to Jacobs and Seitzer the little holes are generated inside neutron stars.

It works this way. Take one common or garden variety neutron star. Pile matter on it. You can do that by putting the star in a dusty region of the Galaxy, or by giving it a normal-matter companion in close orbit: the companion loses mass to the neutron star.

As the neutron star grows, a "pressure and density spike" develops in the interior. If you keep piling on enough matter the neutron star will simply collapse into a large black hole, but let's consider a time just prior to that: a time when the interior of the neutron star is far denser than its surface.

Jacobs and Seitzer offer mathematical proof that it's at least possible that the interior collapses into a mini-hole, leaving the rest of the neutron star intact!

Once the mini-hole is formed, it begins to evaporate. On the other hand, it's inside a neutron star, surrounded by all that lovely dense matter, and it can begin to feed. By eating neutrons the hole grows larger. Thus we have two counteracting tendencies: the hole eats the star, growing larger, and also undergoes Hawking "evaporation". Under certain conditions the two may just balance each other. It's even possible that the tiny hole will prevent the formation of a big black hole, thus giving the neutron star a few billion years more of normal life.

Sigh. It's hard to see how those holes can be useful. There are all kinds of marvelous things you can do with a mini-hole if you can get at one, but the interior of a neutron star is a well-protected place; nature's safe deposit box. Back in the old days before Hawking evaporation, we thought mini-holes might come to rest inside asteroids, and it would be no great trick to go move the asteroid to get at the hole; but doing that to a neutron star would be a bit more difficult.

It would also be dangerous. The hole exists in equilibrium, eating the star at a rate to balance its evaporation. Disturb that and the entire neutron star could become a black hole in milli-seconds! It would also toss out a bit of energy: 10^{55} ergs. (For comparison, our Sun puts out 10^{39} ergs each year, and an ordinary nova gives off 10^{44} ergs.)

In fact, Jacobs and Seitzer describe ways these mini-holes might be the driving mechanism for super-novae. They also speculate that this could be a mechanism to explain gamma-ray bursts, and here we leave the realm of theory to return to the real universe. Gamma-ray bursts exist, and their spectra are consistent with events predicted

by the Jacobs and Seitzer mini-hole theory.

Now *that* gets interesting. As MIT's Phillip Morrison put it recently, x-ray astronomy strives for predictive power, but so far is more like social science than physics: we can find ways to *explain* observations, but not *predict* them. Of course Jacobs and Seitzer haven't made a prediction either, since they knew of the x-ray bursts before they devised their mini-hole theory; still in all, they've as good an explanation as anyone.

Those x-ray events are bothersome. They're also hard to study, because of the atmosphere. Of course that's fortunate: if we could directly observe those x-rays coming from space, we'd none of us be here. Our atmosphere lets ordinary light squeak through with 20% attenuation, but it stops x-rays cold, and that's just as well for us, but bad for astronomers. Thus it's only since we began sending up satellites that we learned of x-ray events, and we still don't know much about them.

What we do know is driving astrophysicists nuts. Astronomy, after all, is usually concerned with rather slow and stately phenomena, and highly repetitive events, such as orbits. Things aren't supposed to change very fast. Now suddenly we're confronted with rapid x-ray events, and to make it worse we can't focus the x-ray satellite "telescopes" very well, so we can't even be sure of where the x-ray bursts are coming from. However, the Dutch astronomical satellite has a rather small field, and happens to point in a good direction, and it says that a probable source of x-ray bursts is globular clusters. And that's weird.

Globular clusters: big balls of very old stars. About 200,000 stars to the ball, packed very close with average inter-stellar distances of light-months. There are a number of such clusters hanging about the galaxy in a kind of halo. Being *very* old stars they ought to be stable, without too many strange things happening; but here are these x-ray bursts.

The bursts themselves look like a spike of energy, then a slow decay. Typical: every 4½ hours the x-ray energy goes from essentially none to a lot in about 0.1 second, the event lasts at peak for about 10 seconds, and then decays over a period of hundreds of seconds. That needs explanation.

Possibly the Jacobs-Seitzer theory will cover the facts. There are other theories, very far-out, *weird* in fact, probably wrong, but really beautiful. Take, for example, crashing neutron stars.

Imagine a rather floppy disk of gaseous matter orbiting a star like the rings of Saturn. Put this whole mess into a globular cluster. The disk probably isn't that hard to come by in there: globular clusters act as gravitational traps, and might

easily accumulate all kinds of cosmic junk, including the debris of old stars, etc.

Now imagine a neutron star in an orbit tilted with respect to the plane of the floppy disk. Every half-orbit the neutron star crashes through the disk, producing x-ray bursts. A *lovely* idea.

Alas, it's almost certainly wrong: there are many sources of x-ray bursts, and it's just hard to believe that anything as unlikely as crashing neutron stars are *common,* even in our queer universe.

Let's try another theory: flash-burning. Take one neutron star. Let hydrogen fall on it. The hydrogen accumulates on the surface, slowly building up until the neutron star has an "atmosphere" a few millimeters thick. The density increases sharply until it hits the critical point, and bang! Every few hours there's a hydrogen bomb enveloping the neutron star.

Far out, right? Yet those theories were described at a meeting of the super-orthodox AAAS. Now let's look at some "neglected" theory.

* * *

Dean Drive: science fiction readers must know about that. Norman Dean was a crackpot inventor. Many years ago he built a gadget. (He also took out a patent; on that, more later.) Dean claimed something that sounds very reasonable, hardly far out at all: that his mechanism "converts rotary acceleration into linear acceleration." After all, a rotating object does have acceleration, right? Acceleration is acceleration, right? Thus to convert from one to the other violates no conservation laws.

Now that's an attractive concept. Take an electric motor (Dean used an ordinary quarter-inch electric drill) as the source of rotary acceleration; hook it up to the Dean mechanism; and lo, you have a spacedrive. Very attractive, because by installing a Dean Machine in a nuclear submarine we'd have a spaceship already built!

Now Dean did build a machine. It did *not* lift itself off the floor. Observers agree on that much—and that's about all they do agree on. The machine shook and shimmied and jumped up and down, and there was a famous photograph of Dave Garroway shoving a piece of paper under the machine. Also, John W. Campbell Jr. reported that he'd seen the apparent weight of the Dean Machine, as measured on a bathroom scale, appreciably decrease when the gizmo was turned on, to be restored when it was switched off. G. Harry Stine reports that he felt the machine push against his hand; push hard, and when it was turned off the push wasn't there.

Unfortunately, that's about the sum total of observational evidence. Dean never let his machine be examined by anyone else. However, the story doesn't quite end there.

Not long ago Harry Stine published an article about the Dean Drive in that Other Magazine (the one with rivets). Robert Prehoda (DESIGNING THE FUTURE; Chilton, 1967, among other excellent books) and I were discussing Harry's article (Harry is an old friend of Prehoda's) and it came out that Bob Prehoda had tried to buy the Dean Drive back in the early 60's. At the time Bob was representing the Rockefeller family, so the ability to pay real folding money wasn't in question. I knew of a couple of other aerospace firms who'd also made the effort. The stories were remarkably similar: Dean wouldn't let anyone examine the machine. He wanted a million dollars and a Nobel prize up front: *then* you could play with the gadget. No one was going to put up that kind of money without seeing the gizmo in operation. There are just too many ways the reported results could be obtained without anything new. For example, if you jump up and down on your bathroom scale at just the right frequencies, you can fool the scale into thinking you're either lighter or heavier than you are; its response time just can't handle that non-steady weight.

Prehoda had also known Dr. William Davis, USAF colonel and successful inventor, who had worked out a physics theory which, supposedly, allows the Dean Drive and other "reactionless" drives to work.

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RANDOM HOUSE

Willy "Spacedrive" Davis spent a lot of time promoting what came to be called "Davis mechanics", and although his practical work made him a good bit of money, he acquired an unenviable reputation among theoreticians. Harry Stine worked for Davis and built several gadgets supposed to test the Davis theories.

Davis is dead. Norman Dean is dead. John W. Campbell is dead. And neither Prehoda nor I could get out of the back of our minds a simple fact: Gregor Mendel discovered genetics but the results lay unused from 1868 to 1900 because no one wanted to listen to this crazy abbott. Could something similar be happening here?

We doubted it, but it did seem reasonable to try to get all the data together in one place before everybody who actually saw the Dean Machine, or tested Davis's theories, went off to Murphy's Hall. We decided to invite Harry to Los Angeles to confer with some other people on how best to test this whole concept once and for all. Understand: none of us, not one, really "believes" in spacedrives; but the concept is so blasted important and the consequences are so far-reaching, that surely it's worth a little effort?

So who do you invite to such a conference? What's needed are people with minds that are "open", but not minds pierced with gaping holes; with enough knowledge of physics and math to follow the arguments; and enough scientific integrity neither to bite on the idea simply *because* it's unorthodox nor to reject it for that reason.

We ended up with: Robert Prehoda, chemist and propulsion systems expert; Larry Niven; Dan Alderson, astronomer and computer scientist; Robert Forward, physicist and gravitation expert; G. Harry Stine, engineer and gadgeteer extraordinary; and myself. It was an interesting lunch. Something may come of it. And the result illustrates precisely the point of this column.

The general reaction was simple. Davis's theoretical papers are interesting, but not terribly valuable. They assert that there's something wrong with physics. Okay, and maybe there is; but contemporary physical theory has a lot of scalps hanging from its belt. Maybe it needs changing, but not without some convincing evidence; and mathematical theories *are not evidence*.

That's what I've found very hard to get across to people. In order for a "Dean Drive" or the gizmos postulated by "Davis mechanics" to work we really do have to throw out a very great deal of very fundamental physical theory. You *cannot* simply "convert rotary acceleration into linear thrust" and remain consistent with what we think we know. Spacedrives are just *impossible* given current theory. If you want to move a ship in inertial

space, you have got to throw reaction mass out the back end, and that's all there is to it.

Now, sure, theory can be wrong. Einstein did his thing, and Newtonian physics has never been the same. We've yet to come to the end of the changes wrought by quantum mechanics. Moreover, what with 100 and more elementary particles kicking around, many believe that physics is *due* for a restructuring along the order of the changes rung in by Einstein.

But note: Einstein didn't generate his theory out of pure math. Far from it. His contributions came in explanation of *observed* phenomena that simply couldn't be explained by Newtonian concepts. The change in the perihelion of Mercury; the photo-electric effect; the Michaelson-Morely experiment; all *these* said, loudly, that there was something wrong with physics and it was time to get up a new theory.

Davis, on the other hand, played about with math and came up with "predictions" absolutely impossible within present physical theory. Is there any wonder that no one takes them seriously? Now a working "Dean Machine" would change all that. If you can actually build a gizmo that produces thrust without throwing mass overboard—even a *tiny* thrust—then there's nothing for it: physics is in trouble, and new theory *must* be found. Without such evidence, though, there's simply no reason to revise physics theory. After all, the "orthodox" stuff works quite well. It fits the observed universe.

Now: there remains Harry Stine's memory, after all these years, of that machine pushing against his hand. One result of our conference was a consensus that if the Dean Machine did not work, it at least did not employ any of the common means of producing spurious results. It didn't have feet that periodically touched the floor, and such like. That doesn't mean it worked the way Dean said; it just means we don't know how the result was obtained.

Then too, when Harry Stine was working for William Davis, Stine built a couple of gadgets (see Harry's ANALOG article for details) that gave results you certainly wouldn't have predicted in advance. They *may* be explainable in "normal" theory, but they are a bit queer, and they do fit Willy Davis's theories.

The upshot of our meeting was this: the theoretical stuff can wait. What's important is that Harry Stine, as one of the few men now alive who actually saw the Dean Machine and also worked with experimental gadgetry to test Davis mechanics, get his *experimental results* into proper form and publish them. *That's* what's important. *Evidence*. As Bob Forward observed, once the plans are published, one of these days a research physicist will build the apparatus: and if several

different labs get the results Harry did, and have no conventional explanation for them, *then* it will be time to trot out the theories. "One good experimental result is worth a thousand theories," Forward said; and he's right.

Back in the old days a number of us built Dean Machines from the patent specifications. We had technicians and they had to be paid between jobs; might as well use them to test new ideas. None of the gizmos worked. I now know of four that were built. Harry Stine can explain that: Dean, being, uh, highly suspicious, didn't describe his actual gadget in the patent. Of course that's stupid, because a patent protects only what's disclosed, but it's very much in keeping with what's known about Dean's personality.

Harry says the actual Dean Machine was the goldarndest collection of springs and slipclutches and mechanical linkages he's ever seen in his life. He also says it pushed hard against his hand, and he'll never forget that. Harry thinks Dean had something. The question is, can it be reproduced? Did it "work" as Dean thought, or did it merely act strangely? There are ways to test that, unambiguously. Until that's done, though, theory isn't relevant.

So it's that simple. It isn't that the "establishment" won't *listen,* as so many would-be theorists insist; it's that the newcomers insist that physicists *only* listen. They have nothing to *show.*

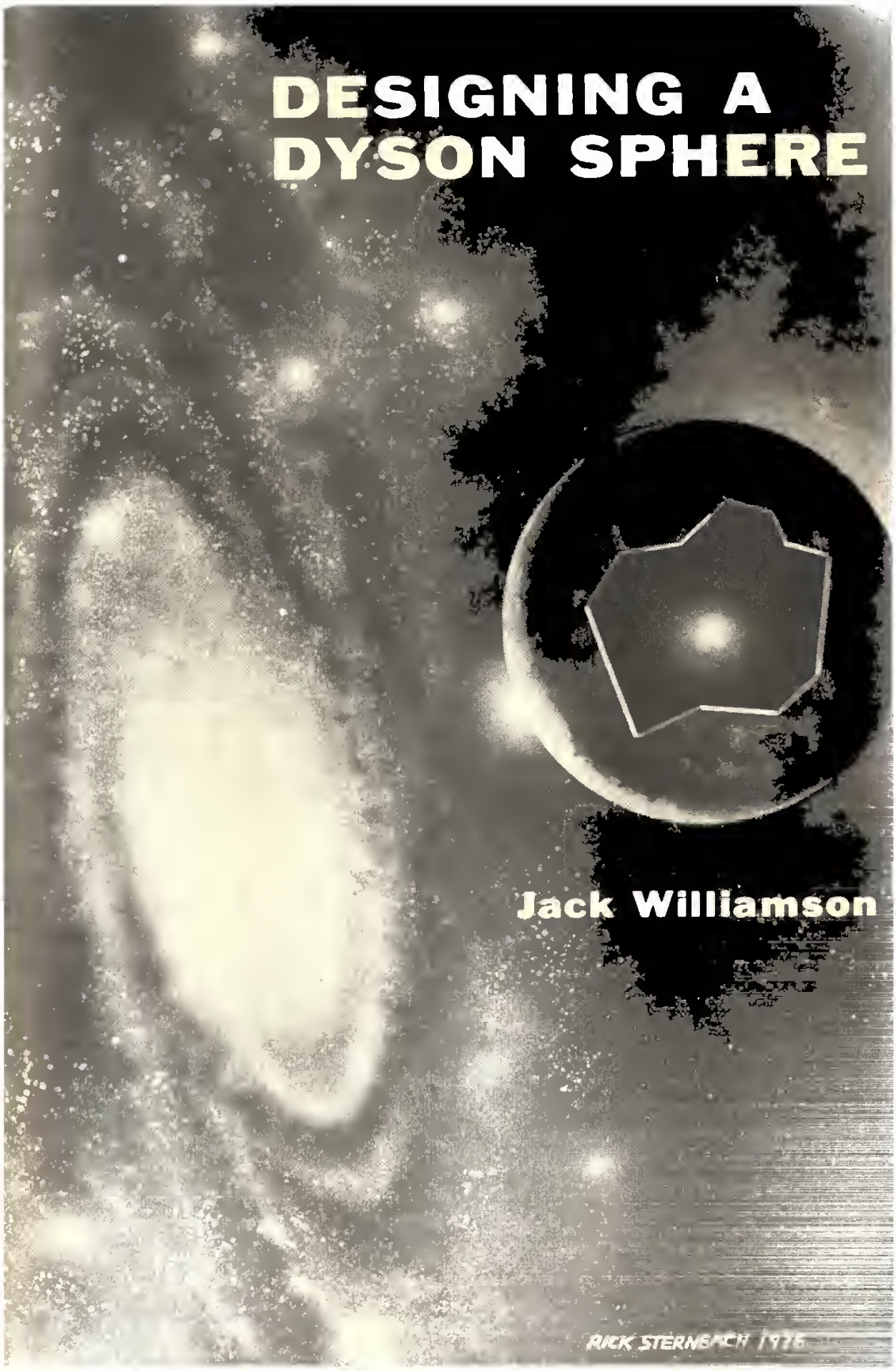
Now I get all kinds of blueprints and plans and equations from my readers. Those who send them assume, I hope rightfully, that (1) I know something of what science and technology is all about, and (2) I try to keep an open mind. I'm willing to listen.

But please, all of you who have new ideas, keep in mind what I said earlier. If you have plans for a perpetual motion machine and you really believe it will work—why, build it! Don't send out plans only and then complain that "nobody listens". Of course nobody listens; it takes a lot of effort to spot the flaw in a very complex device (one I was sent ran to fifteen pages of drawings) but the chances are good that the flaw is there. I don't care how good a theory you have to prove that you can get energy out of your swimming pool; but I care a lot if you have built the device and it works.

Experimental results. Build the device. Make it work. And *then* if nobody listens, something can be done. Certainly "orthodox" physics doesn't know everything. I've said myself that I believe (emotional bias only; I have no hard evidence for this) that we'll someday build faster-than-light ships, and yes, I suspect there might even be "spacedrives."

But we won't find them from blueprints. It takes evidence. Once you've got that, you'll find plenty of people to listen. ★

DESIGNING A DYSON SPHERE



Jack Williamson

AN IMPOSSIBLE OBJECT appears at the fringes of our galaxy, looming out of unknown space at a sixth the speed of light. The size of a giant star, it seems incredibly solid, not gaseous, and cool as a planet. Yet it's far too light to be a mass of any possible substance. Any really solid object of its size would be sucked into a black hole by its own gravitation. Baffled by its riddles, the galactic observers call it Cuckoo.

It's a Dyson sphere, designed for the science fiction trilogy I'm now writing with Fred Pohl. Outside such fiction, Dyson spheres still belong to theory, as did positrons and neutrinos not long ago. Yet there are exciting reasons to believe they should exist. Though no actual observations have been confirmed, they're open for imaginative exploration.

Such probing of possible alternative worlds is half the fun of science fiction—perhaps more than half for the writer. Yet even so, too few writers venture as boldly as they might. Too often we're simply informed that the new planet just happens to be oddly Earthlike, happily provided with breathable air and a friendly biochemistry.

The universe offers probable worlds enough awaiting exploration, actual or imagined. Our own galaxy holds perhaps a hundred billion suns, and there's accumulating evidence that a family of planets is formed with every normal star. Most of them, however, will offer our spacemen a pretty grim welcome.

We Earthfolk inhabit a pretty limited ecological niche. In the scale of cosmic temperatures, ranging from the absolute zero outside the galaxies to the hundreds of millions of degrees inside the stars, our sort of life is confined to the narrow zone where water is commonly liquid. In our own planetary family, Mars is now too cold, Venus far too hot.

We require free oxygen, which is thermodynamically unstable and therefore probably rare—our own supply is here only because the chlorophyl in plants releases it faster than it can combine again. We can only suppose, or hope, that other worlds will evolve equally helpful plants.

We require a sheltered environment, permanently protected from all sorts of common cosmic extremes—from the deadly gases in other planetary atmospheres, from the energetic ions around Jupiter, from the meteors that once bombarded the moon.

Our own Earth is an unlikely place, though precisely how unlikely we can't yet say. One star in a hundred may have a planet where we could feel at home, or one in ten thousand. The odds are still unknown, but most worlds are going to be different.

A few science fiction writers have become specialists in exotic planets. Notably Hal Clement, who

has created big worlds and strange worlds, hot worlds and cold ones. Both he and Poul Anderson have written illuminating chapters on the invention of new planets and new forms of life for Bretnor's *Science Fiction: Today and Tomorrow*.

Often, of course, the writer is more intent on biological and social extrapolations than on new geologies. Ursula Le Guin's planet Winter in *Left Hand of Darkness* is about what Earth might have been at the peak of the last ice age; the absorbing innovations are in her people and their culture.

But the problems of building physically different environments does offer a stimulating mental challenge and a widened scope for all sorts of story development. The Dyson sphere that Fred and I have been designing for our new trilogy is I think the largest habitable world in all science fiction.

Freeman Dyson is a mathematician at the Institute for Advanced Study. He has suggested that our neighbor civilizations might be observable in space as points of infrared radiation, because a really advanced people might be able to trap and use all the radiation shining in every direction from their sun, allowing only waste heat to escape.

The simplest way of doing this would be to build all the metal of the planets into a swarm of sun-vaned spacecraft, moving in orbits that keep them spread in a cloud all around their sun. I have suggested this sort of thing in a novel called *The Power of Blackness*, but for the trilogy we wanted a solid wall around the star.

(Larry Niven took one step in this direction with *Ring World*. His invention is an immense metal ring spinning around a sun, so fast that its air and its inhabitants are held against the inner surface by centrifugal force. To make the ring, he requires a very remarkable metal.)

Our own first problem was building material for the sphere. Most of the Universe is hydrogen. The heavy metals, formed only in supernova explosions, are relatively rare. At best, the stuff of any ordinary planetary system would be enough to make only a flimsy sphere.

But ours was to be a sort of cosmic ark, constructed by the common effort of all the intelligent races of an ancient galaxy, designed to carry them to safety when the galactic core explodes. Materials for it could come from many thousands, or even millions of stellar systems. Iron and its sister metals, incidentally, ought to be relatively plentiful in such an old galaxy, much of it formed by natural supernovas but more of it artificial. Very stable elements, they would be logical waste products from the most sophisticaed fusion power generators. We can assume the technology not only to build such generators, but to fabricate the waste metal into extraordinary alloys.

Even given such alloys, however, there are still grave engineering problems in placing a solid shell around a star. No possible metal would be rigid enough to support itself against the gravitation of the central sun, or even against the pull of its own mass. Though a hollow sphere might be rotated fast enough to support its equatorial zone with centrifugal force, its polar regions would fall in.

The solution we found was to surround the star with several layers of ring-shaped tubes. The tubes themselves are stationary, but they contain a heavy, low-viscosity fluid flowing fast enough to create the centrifugal force required to support the tubes and the loads above them. One set of parallel tubes holds up the "equator"—which isn't really moving—and other sets, tilted at suitable angles, support the regions near the "poles."

The tubes are also heat-engines, with the fluid driven by energy absorbed from the sun and flowing through generator stations which supply power to all the inhabited levels above. Master computers adjust the velocity of flow to fit the loads.

Cuckoo is enormous. With a radius of 86 million miles—200 times that of our sun—it's 540 million miles in circumference. The surface area is vast almost beyond imagination—some 9×10^{16} square miles. Space enough for story action!

Though light for its size—a high vacuum in the same space might weigh more—it's heavy enough. The entire construction, including tubes and fluid, living quarters and control devices and surface armor, cargo and fuel and atmosphere, has some ten times the mass of the star inside, which in turn is heavier by half than our sun.

The shell is equivalent in weight to a plate of solid steel more than two miles thick; with the open spaces between the several levels, its total thickness is some forty miles. Massively armored, with the supporting tubes arranged in multiple layers, it is well protected from accidental damage.

With fifteen solar masses, Cuckoo has a surface gravity about one percent that of Earth. This is force enough to hold the atmosphere which has collected above the outside armor. Part of this is interstellar gas; most of it is waste oxygen and helium from nuclear power plants which use water for fuel—tanks for this fuel form vast seas on Cuckoo's surface. This oxy-helium mix is breathably dense at the lower levels and a hundred times as deep as the air of Earth.

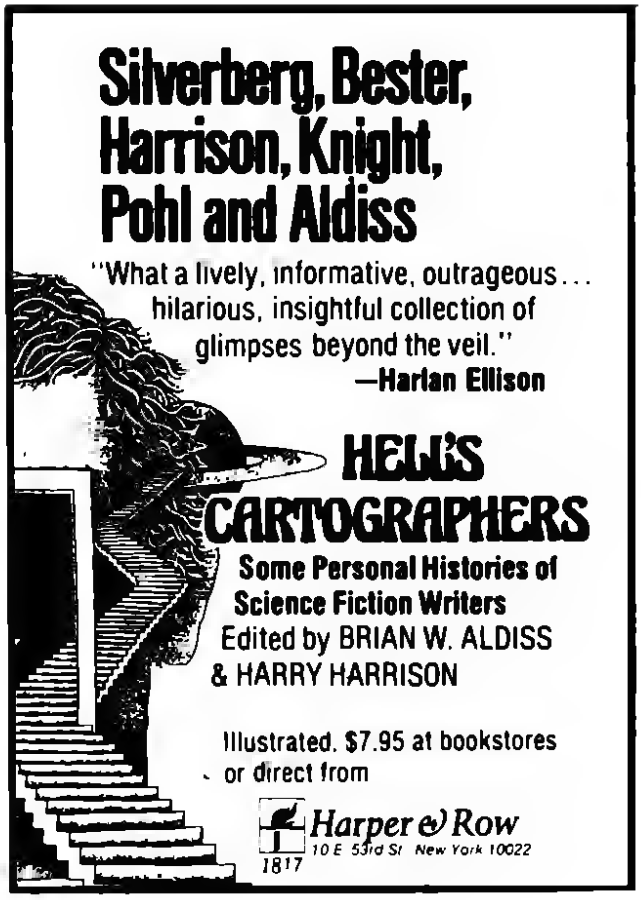
The last link in the complex energy-chain from the inner star, carrying convective heat from the metal surface toward open space, the atmosphere of Cuckoo has its own awesome meteorology, with storm-clouds rising a thousand miles high.

Launched out of its exploding home galaxy in search of new worlds, the sphere is not only a super-planet but a supership. An immense ramjet, it uses magnetic fields created by the flow in the centrifugal tubes to sweep up cosmic gas, which is drawn past the central sun, energized, and expelled behind.

The propulsion system raised new engineering problems, the worst of them due to the fact that a star at the center of a massive hollow shell is in unstable equilibrium, so that any nudge would tend to tip it toward collision. We were able, however, to turn this dangerous instability into a means of propulsion. The solution here is to store the surplus water and centrifugal fluid in enormous tanks spaced about the sphere, with a system of pumps to empty or fill them as necessary to adjust the gravitational balances to keep the sun in place at the center of the moving globe.

This pump system and other controls are hooked to a complex net of sensors inside the sphere and on orbital satellites, and to the master computers, which are entirely automatic robot devices equipped with failsafe defenses and elaborately protected against time, accident, and vandalism.

The passengers of Cuckoo are less immune to time and change. As the sphere was completed, they left their home planets for their alloted spaces in the levels between the inmost layer of centrifugal tubes and the heavy outside armor. Most of them are still there, some still active, others surviving in various states of arrested animation.



By now the sphere has been in flight for hundreds of millions or perhaps billions of years, the remnants of its exploded native galaxy lost in the cosmos behind. Some of the races that built it are extinct; many have forgotten their origins, evolving or degenerating into wholly different orders of life, often in conflict with one another.

The outer surface was at first an

endless plain of bare metal, but much of it is covered now with soil from accumulated cosmic dust and the industrial wastes dumped from the occupied levels. Plant life has evolved there, supported by the energy-flow from below through a process of thermosynthesis. These plants are often luminescent, so that vast landscapes glow with varied color. There's animal life, adapted to the low gravity and to varied local conditions of light or darkness, heat or cold, wild storms or unending calm—with no rotation and no external sun, Cuckoo had no seasonal climatic change. Most of these beings evolved on the surface, but some are migrants from below. A few are human.

Not, however, native to Cuckoo. Much fiction to the contrary, our human body can't be a cosmic norm. There are arguments, of course, that the evolution of intelligence on every world would tend to follow parallel tracks, that the logic of change would demand our bipedal shape and our erect posture, elevating the eyes and the brain and freeing the hands for tool-making. But all those arguments are rationalizations, I suspect, which overlook the chance factors that have helped make us what we are.

The human inhabitants of Cuckoo are descendants of specimens taken by a scouting ship from Cuckoo that touched Earth many thousand years ago. Escaping to the surface, they have evolved physique and culture to fit their new environment. Though still at a primitive level, they've learned to fly with crude leather-and-fabric wings.

Though we've assumed technologies for interstellar flight for our own galactic cultures as well as for the builders of Cuckoo, we've tried to respect the velocity of light as a relativistic limit to the speed of any material thing. For a solution to the problems of communication, we call on Jerry Feinberg's tachyon, the hypothetical subatomic particle whose minimum-energy velocity is infinite. Though nothing material can be sent by tachyon beam, holographic scanning of objects and even of living beings yields information that can be transmitted to produce instantaneous replicates—copies of an original that remains safe at home.

In bald outline, these have been the basic assumptions of our trilogy, the bare physical foundation for all the complex extrapolations of culture and society and character and action that go into the making of fiction. *The Farthest Star* is already published. The novels to follow will continue to trace the impacts of Cuckoo on our galaxy. The details are beyond the scope of this paper, but I find designing such worlds a stimulating exercise of the imagination, more exciting than crossword puzzles or duplicate bridge. I hope readers will enjoy the exploration of Cuckoo as much as Fred and I did the building of it. ★


LOVELIFE
OF THE
LEELORN
CRAIG STRETE

What makes Sanderman run? Why, Candyboxes' legs, of course!

THE LITTLE PURPLED-HEADED boy of summer squatted in a semi-military position beside the path and watched the ants falling down the sides of anthills. He had come before daybreak to sit by the path in the hopes that he might speak with the master. His little purple head was filled with visions of material gain.

If he brought his master the tongue of a human being would not his master be pleased? Would not his master give him a wondrous gift if he could bring the master a naked lizard shaped like an aircraft carrier? Rappi's head was full of such thoughts. Most of all he desired to please the master, which was not an easy task.

First one had to meet him. In order to do that it was necessary to hide in the bushes beside the path, keeping a sharp lookout for the master, all the while hoping to catch him in a good mood. "When the master is ugly from the toes up, you will be underfoot," was one of the sayings in the village. "The day the nine-legged horse steps on the master's foot is not a good day to kick the master's dog." That was another saying in the village. When one dealt with the master, one had to watch out.

The ants were busily engaged in dragging stuff up the anthills so other ants could push it back down again. There was a saying in the village; "as busy as an ant and twice as nuts." The village was full of good sayings. Rappi was trying to turn an ant over with a dead cone-pole snake he had found in a bush by sitting on it.

There was a wild, crashing noise off in the distance. It sounded like two semi-elephants mating through a knothole in a wooden fence. It sounded like a flamenco dance troupe being raped by a Salvation Army Band. It was loud and seemed to be heading in Rappi's direction.

Rappi jumped with fright and dove even farther back into the bushes. Perhaps it is the whistling moose that swallows little boys, thought Rappi. Perhaps it is the big old Wild Man of the Mountains, the toothless one who gummed little children to death whenever he caught them. Perhaps.

Rappi crouched flat against the ground in terror, his primitive mind filled with childish fears and superstitions. A grey and white thing with a sunburn and a peeling nose

smashed through the bushes and onto the trail right in front of Rappi. Rappi allowed himself to relax a little. It was only the master.

But the master was being very much ugly from his feet on up. He was yelling like he had needles through his shirttails and he looked like he had been dragged across the jungle by a slow snake. His shirt was three colors, two of them dirty, and his pants were dirty here and there, being clean mostly in the places where they had holes. The holes were very clean.

It was not a good day for the jungle. He was tearing it up left and right and scorching the air with his language. Rappi decided he would stay in the bush and not bother the master today. Rappi could not think of any saying in the village that covered hiding in the bushes when the master was like he was, but he thought to himself, that there sure ought to be one.

* * *

Ideas went through the master like a hiss in his brain. There was a ringing in his ears and a constant pounding at his temples. He smashed through some reeds near the river bank and his shirt caught on a thorbush and came off in two big hunks, and armhole for each hunk.

He swore and swung at the bush with his fist. The blood that started flowing out of his hand sobered him a little. It hurt like hell and that brought him a little closer to rationality than he had been all day.

It reminded him why he was angry. It was that damn Rappi who had used the last of his shirts to clean out the lizard cages. Or was it Bappi? All those damn aliens looked alike. They even had the same sort of names. Whoever it was, if he ever caught him, he'd flay him to the bone.

Of course, that wasn't the real reason he was upset. No, it went deeper than that. It was rain and the legs of a stripper named Candy Boxes.

It hadn't rained in seven months. He would have sold his mother for a cup of water. How long had he been drinking the muck the natives of Mintfrappe siphoned out of trees? Had it really been seven months? Seven months of Virpa sap which tasted like something the dog brought home instead of depositing with upraised leg on the fire hydrant.

And one of those crotty aliens, how the hell did he know which one, had tried to take the tacks out of the picture of her he had nailed over his bed. Enrico Fermi! Those idiots would eat anything with metal in it! One night he woke up and two of them were under the bed, chewing on his bedsprings. It was one hell of a life.

And Candy Boxes, did she care about him? If he wrote her a letter, saying, "DEAR CANDY, THE DOG ATE THE TOP HALF OF

YOUR PICTURE BUT I STILL HAVE YOUR LEGS ON MY WALL'' would she care? No, she wouldn't care. She'd just laugh and jump on top of an astronaut. It was depressing.

He knew she was laughing at him and running around jumping on astronauts. That was what sent him in desperation into the Planetary Foreign Legion and to this God forsaken planet. She had an uncontrollable urge for astronauts, planetary explorers and spacemen of all types. He could never quite reconcile himself to it somehow. He was always tripping over a spacer's tote bag in the bathroom. There was always somebody shaving in the mirror before he got up in the morning. And they all had tatoos on their arms that said in Old English script MOTHER.

He would have had himself tattooed too if he would have thought it would have made any difference to her. It wouldn't have. Candy Boxes liked only what was fashionable and what was fashionable were the brave men who explored space, roaming the galaxy to come back to earth after months of celibacy, hornier than hot rabbits with socks on. The in-thing to do was relieve these brave men, to comfort them after their prolonged abstinence. After all, said *Women's Bare Daily,* what greater reward could the women of earth offer these returning heroes? Candy Boxes agreed with that sentiment entirely. She agreed with it everywhere and with everyone. She agreed to it in a variety of positions. That was why Sanderman retired from chiropodist work and signed up for space duty.

Did Candy Boxes know her legs were on the wall? Sanderman the master used to beat the little alien girl called Dunchfito because she didn't have Candy Boxes' legs. Dunchfito had her name tattooed on each of her legs, hoping it would help him figure out that he was certainly right about little Dunchfito's legs not being Candy Boxes' legs. It did not seem to help in any way or clear up the confusion. Dunchfito always got her revenge though.

She always waited till he fell asleep then cracked him over the head with a rubber-headed mallet. He always woke up the next morning with a blinding headache and a fuzzy spot on his head that was beginning to soften after several months of nightly poundings. He never woke up when she hit him but he did have reoccuring dreams. Sometimes he dreamed he was a tennis ball, sometimes he dreamed the entire chorus line of a musical variety show was kicking his head in.

His dreams did not terrify him but he did wake up a lot of times in the morning with the feeling that the entire population of Mintfrappe had walked across his tongue in their socks.

As blood dripped from his thorn-damaged knuckles, waves of

grey matter fluttered like clouds in his brain. He just had to mangle something, to bash its stupid breathing face in. Tear its legs off, get hair between his teeth, see pulp, pulp. The more he thought of it, the more he felt like going berserk.

He cursed like a madman and went boiling off into the jungle again. He smashed through a particularly thick clump of bushes and fell into the river like an old stuffed duck with loose wings. The river was dry, choked with dust and boulders. He missed the dust.

He sat there, numb from his bruised hip up, numb down to the toes too. There he was, a once reasonably intelligent chiropodist, living a comfortable life among the feet of other people, maybe a guy a little too hung up on . . . Who the hell was doing all that screaming?

He looked up on the bank and saw a dimpo bird shrieking like a five alarm fire. Oh Christ, if he only had a gun! He used to have a gun but one of the damn aliens ate it. He'd found the pearl handles with teeth marks in them. That was all that was left.

He picked up a rock and heaved it with all his might at the bird but he missed it completely and it flew off screaming even louder. Sanderman gave it up.

* * *

Every day Sanderman went a little bit berserk in the jungle. All it had to do was rain. Just once. Just one little, insignificant day of rain and he could get out of there. The river was the only way out and the only way out was dry. The time when the rains should have come was already gone. Long since gone. The only way into the village of Mintfrappe was down the river after the rains came. He had been assigned there until the rains came and his replacement could boat in as he, Sanderman, rode the river out. No one had yet figured out how to make a metal-free air-vehicle.

The village he was stranded in was surrounded by inpenetrable jungle. A hundred times he had set out to beat his way back to civilization only to return defeated to the village of Mintfrappe. He had tortured dreams of being stuck there forever. What if it never rained ever? What if Candy Boxes ran off and married a lunar module salesman? His life was a nightmare of just such hideous possibilities, made all the more hideous because he was, so to speak, up the river without a river.

His anger spent, his hip bruised, he limped back into the village compound with his hands over his ears. He was unable to shut out the inevitable sound of the nutcracker birds the natives kept as pets. There was a continuous cracking sound. Crack. Crack. It continued unabated twenty-four hours a day. Crack. Crack. When they ran out of nuts, they did impressions. Crack. Crack.

It brought tears into his eyes.

An old purple-headed man crawled out of one of the doorways. One of his legs looked like a CARE package for Doctor Frankenstein.

"I hurts my hoofer," said the old man, smiling like he deserved praise. "Will master look, see, view, get eyeball of, leg?"

The old man shook his purple head from side to side like a dog suppressing a sneeze.

"Nuts!" said Sanderman, with a look of disgust. "Can't you see I'm crazy?"

"Eye is 20/20," said the old man. "You describe, I tell you if see it. What colors is it most of?"

"Nuts," said Sanderman. The statement had very little feeling left in it by now.

"Colors of nuts, most sure," said the old man, falling over as his bad leg collapsed under him without warning.

Sanderman bent over him and unwrapped the strip of bark that one of the native women had tied around it. An old dead rat fell out of the wrappings. It was a dead rat of the long-dead variety.

"What the hell is this doing in there!" screamed Sanderman.

"Lunch," said the old man, innocently.

Without a moment of hesitation, Sanderman turned around and tossed his cookies all over the ground. He tossed them in one beautiful, continuous stream that splashed merrily over his shoes.

The old man stared at the remains of Sanderman's breakfast with the respectful eye of the gourmet, with the speculative eye of the comparison shopper. Fortunately, Sanderman was unaware of it or he would be bent over even longer, pumping long after his well was dry.

"What you say master? You cure leg up? Put the fix cure up?" said the old man, wanting to know.

Sanderman, holding his stomach with one hand, picked up the rat with the other and tossed it over his shoulder.

"Lunch," said the old man sadly as it flew over Sanderman's shoulder.

Sanderman ground his teeth together so hard his gums got flesh wounds and bent over to examine the old man's wound. It reminded him of a girl he knew in New York. The city not the state. She always wore red socks. She had a pimple on her right knee. Or was it her left? He couldn't remember her face but the knees were very familiar.

"Filthy!" said Sanderman. "You're dying! I told you! I told you! How many times did I tell you?"

"At least," said the old man calmly.

The whole leg was rotten. It was falling off. It was so rotten moss was growing on one side of it. It was so rotten the woodpeckers would be after him in a week or two thought Sanderman with what was hardly a rational thought since

there were no woodpeckers in Mintfrappe.

Everybody was sick with something. It was the national pastime. The climate of Mintfrappe was lousy. The weather featured mild and balmy diseases, festering tomorrow with fever highs in the low hundreds. The village idiot used to have worms in his ears. He had put them there himself. They kept crawling out. He was the only one too stupid to catch something. He was the only healthy one in the whole village and was universally despised. The village idiot was the old man. He finally settled on a surprise amputation which didn't work. At least not completely. He fainted before he got halfway to the bone of his leg. In that sense, he had failed, but the resultant infection had brought him into his own socially. The fact that he was dying of it was the height of fashion. Of late however, the old man had begun to show a markedly hostile attitude towards the prevailing notions of what was considered fashionable. That was why he was the village idiot. He had a short attention span and could never finish anything.

"Will you cure, fix up, me with the stinger in seatbox?"

"Get out of here!" roared Sanderman. "I hope the toes on your other foot fall off too!"

"Why thanking you most much," said the old man, smiling happily at the thought.

SCIENCE AND FANTASY

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Sanderman watched him limp away and he didn't know whether he was supposed to be angry or disgusted or depressed. He worked at trying to be all three but then he thought about the picture on the wall of Candy Boxes' legs and he settled on being suicidally depressed.

He still had the urge to kill something, a feeling in no way dampened by the legs on the wall of his cabin. If anything, Candy Boxes' legs were a further incitement to riot. Aren't legs always what cause riots? It seemed that it must be so to Sanderman.

A drop of moisture splashed coolly against his forehead. It struck softly but had the effect of an explosion on Sanderman.

He leaped into the air, head reared back, mouth open to receive the liquid. Rain! Rain! Rain! His blessed rain! His ticket back to Candy Boxes! A drop of liquid melted on his tongue and his eyes sunk into his head. He looked like he had just been mounted and stuffed. His eyes looking up, his ears hearing that sound. He gagged. Crack. Crack. He threw up with nothing left to throw up. Those damn nutcracker birds! He fell to the ground, completely fagged from gagging.

He'd had quite a day. Sanderman closed his eyes wearily. He could just see it.

At this very moment, Candy Boxes would be putting a slug in the juke box back on earth, U.S.A. Back there in Mother Flicker's Bar and Billiards room. She'd be shooting pool, leaning over the table, her boobs sometimes hanging right down into the side pockets when she was lined up just right. It drove him crazy just thinking about it. And she had a pitcher of beer at her table. Ice cold beer and the glass she was pouring it in was almost clean by at least two days. It was driving him crazy.

Someone tapped him on the shoulder. It was the old man again.

"Can I eats belt buckle?" asked the old man.

"What?" screamed Sanderman, his hand unconsciously straying to the worn metal buckle of his Planetary Foreign Legion issue belt. "What!"

"Owed me for lunch rat throwed without being able to find," said the old man, teetering on one leg in front of Sanderman. The old man looked determined.

He left Candy Boxes with one of her breasts in the side pocket. He tore the belt off with a kind of lethal frenzy and thrust it at the old man with a vicious swing. The old man fell over sideways with the belt wrapped around his neck. Sanderman seemed unaware of the old man's tumble. Just as the old man began gnawing on his belt buckle, Candy Boxes sank the eight ball and an astronaut reached out and dragged her under the table.

Sanderman screamed with impo-

tent fury and went dashing madly off in the direction of the jungle again. He ran headfirst into a tree and that brought him back to his senses, in the sense that he imagined that it knocked the astronaut out. He slid down the side of the tree and rested.

Almost in front of him, the bushes parted and a lizard shaped like a volkswagon with a tongue stepped out into the sunlight. The perfect victim. Sanderman's hands squeezed imaginary pulp in anticipation of the lunge. Just as he was ready to spring all 200 pounds of him on the helpless lizard his attention was distracted by a rather large snake of the unkissably poisonous variety. It was one of those snakes in the who-to-avoid and what-not-to-touch category. It had an unpleasant talent for being fatally poisonous. It was a Foogi Snake, the most dreaded reptile on Mintfrappe.

The snake oozed toward the lizard which promptly froze in its tracks, its tail going limp as a stock market quotation.

"Kill it," shouted Sanderman, aware that the snake needed no cheerleading section.

The snake moved on oiled gears, coiling like a crocheted doily just inches from the doomed lizard's snout. The snake moved its head from side to side in a hypnotic, sleep-inducing rhythm.

"Kill it for me!" whispered Sanderman.

Suddenly, a shadow fell over Sanderman and he looked up at the sky. For the first time in months, the sky was full of clouds.

"The rain!" he shouted. "The rain!" He was in an absolute delirium, overjoyed to tears.

He brought his head back down, taking his eyes off the sky and looked once more at the doomed lizard and the Foogi snake.

The Foogi snake had fallen asleep and the lizard had already ingested a third of him.

* * *

Two days later, Sanderman pulled what was left of the roof of his shack off of what was left of the rest of his body. It had been one hell of a storm. It had been a real frog strangler. Yes sir, a dust storm like Mintfrappe had never seen before and gale winds up to ninety miles an hour. Dust and more dust and nothing but dust. He spat out dust like an upchucking Sphinx.

If there had been something left standing, he would have hung himself from it immediately, but the whole place was flatter than Lizzie Borden's love life. He crawled out from under the building slowly. There was a persistent buzzing in his ears. It was increasing in volume.

It seemed to be coming from above him. He was afraid to look up for fear his head when once bent

back, would continue backwards until it fell off. He took a chance anyway.

It was a spaceship. It was preparing to touch down. He blinked his eyes to make sure it was real. It was real. He let out a whoop, staggered to his feet, and began tottering in the direction of the ship.

It touched down in a great uprush of dust as the jets fanned the ground, easing the big ship to a soft, near-perfect touchdown.

The ramp was down before he got there. The hatch opened as he hit the edge of the ramp. Candy Boxes stood framed in the hatchway, with only her head and torso visible.

Sanderman's head stuck to the roof of his mouth. He had her legs etched indelibly on his mind. How he had ached for the touch of them! The sight of them! Glorious legs, wonderful legs of the evening! Like two poles of pearls shifting towards the center of the universe! Legs! Legs like drink-stirring rods made out of honey and satin! Legs that were win, place and show at the hundred dollar window! Legs that played the tuba in the backseat of his mental car! Legs! Legs!

He stood paralyzed at the edge of the ramp. Her face didn't exist. The dog had eaten it away much too long ago. It was her legs that were his memory of her. How he longed to tie his tongue around her dimpled knees! How he ached to encircle her ankles with his socks!

She stepped through the archway and came toward him. She seemed taller. She was. She stood on two bright aluminum legs that gleamed brightly beneath her. Her steps were smooth and fluid.

"Sanderman!" she cried. "I've come back to you! My long lost lover! My spaceman hero! Rescued at last!"

His mouth fell open in an imitation of the Grand Canyon.

"Your, your . . . WHAT HAPPENED TO YOUR LEGS??????????

"Oh, you noticed!" she said coyly. "Why, artificial legs are all the rage back on earth now! You know me, always keeping up with the latest fashions. How do you like them dear? Don't you think their gleam is positively sinful?

* * *

He fainted and fell back into the dust like a meteor entering the atmosphere. There was a burning finality to his faint.

He died right there and then of a broken heart.

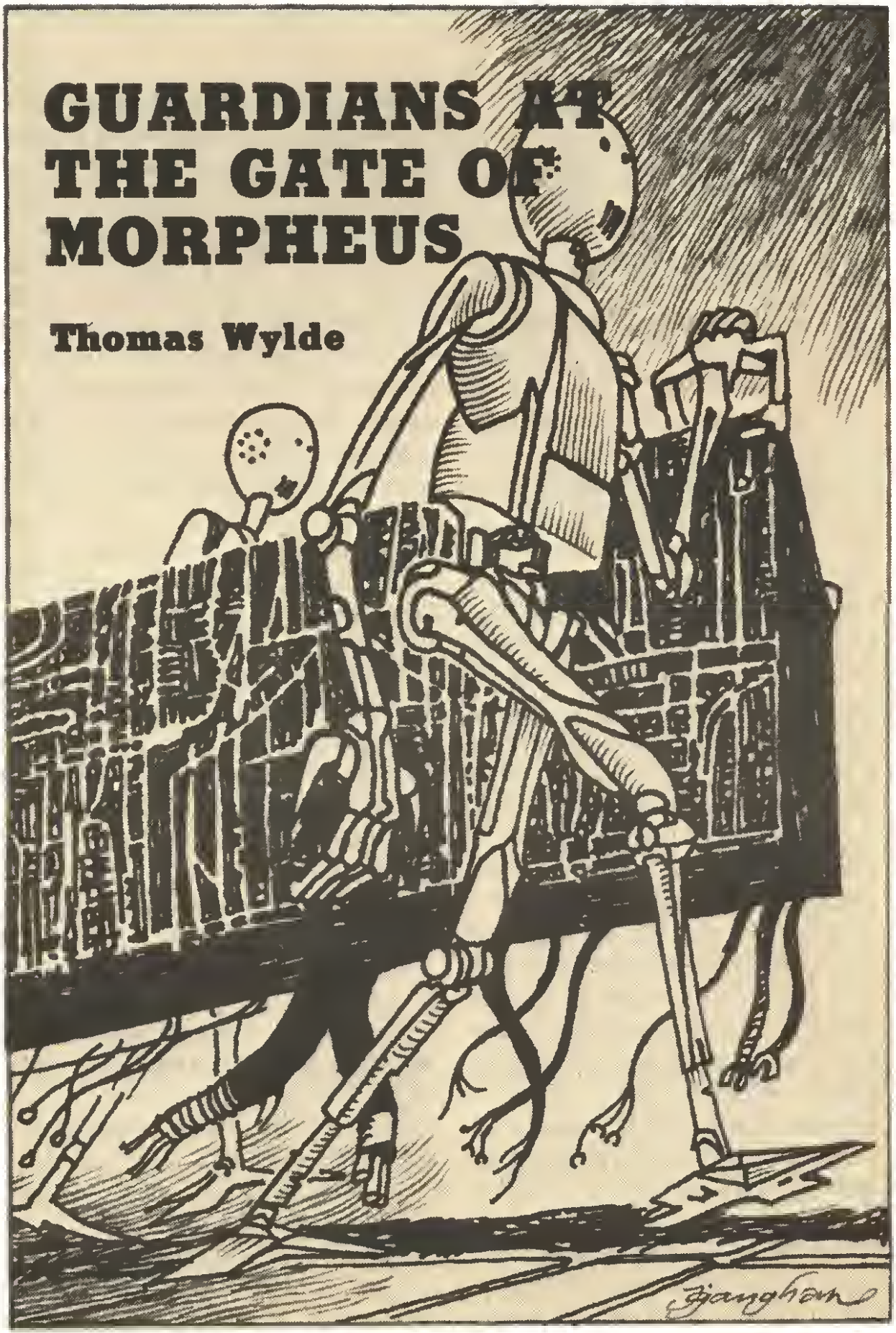
"Jeez," said Candy Boxes, "he was overcome with emotion."

* * *

If only he had known that Candy Box's own precious originals were carefully, cryrogenically stored away for future use, and that he could have had them for himself alone, not even sharing them with Candy Boxes! Such is the stuff of which great tragedies are made. ★

GUARDIANS AT THE GATE OF MORPHEUS

Thomas Wylde



Human Alpha was *not* In Error!

HUMAN ALPHA SAID to Human Beta, "Go Dismantle."

For a moment the four Guardians were motionless in the control room of Narcopolis 408. Outside the room, in the vast pyramidal vault that surrounded them, there was only the whispering sound of nutrient pumps, exhaust fans, and feelie tapes, as eighty-six million hibernating humans dreamt of love or battle or boredom.

"Go Dismantle!"

Human Beta was confused, and so hesitated until the conditioned phrase filtered through his brain and connected solidly with motor reflexes. Then he sighed and turned away, going directly to the Dismantling chute.

Human Alpha smiled and looked back at the two robots, who were watching the situation without comment. There was no way to tell what they were thinking. Their smooth ovoid heads were sheeted in white rubber, exactly featureless.

Human Beta, the other human Guardian, reached the chute, braced his hands on the sides of the opening, and jumped in. The last they saw of him was the pink bald head, the broad black-suited back, and the large white letter B disappearing into the dark. The last they heard was a faint sucking noise.

Human Alpha turned back to his control board, humming. He was making a feelie tape of the Dismantling of Human Beta.

The two white-jumpsuited androids got up simultaneously and stood behind the human, who was busy augmenting the tape. It was their job to oversee the human Guardians, just as it was the humans' responsibility to guard against robotic failure. Check and countercheck, the Narcopolis was secured against operator error.

Now, for some reason of his own, one of the human Guardians had cancelled his partner. It needed looking into . . .

"What are you doing!" asked Robot Alpha.

The human slipped the tape from the recorder and dropped it down the INPUT slot.

Robot Alpha tapped him on the shoulder.

"What?" said the human. "Don't bother me!"

"If you subject the population to the death trauma of Human Beta they will be damaged."

Human Alpha turned from the console and looked at the robot with the black A on its chest. The robot scanned him in turn. The human was the twin of his Dismantled partner—dressed in black jumpsuit, hairless, serene. He had a white A on his chest. "Robot Alpha?"

"Yes."

"Go Dismantle."

It was the cancellation code again and it was not to be ignored. This time there was no hesitation.

* * *

Now there were two Gardians in the control room of Narcopolis 408.

Human Alpha turned back to the console and punched up a universal feelie playback. Throughout the vault, tapes were changing. Ending abruptly were wars and romances, games of tennis and banking, dreams of heroism and degradation. Now began, in excruciating detail and amplified sense, the Dismantling of Human Beta.

Repeat, repeat, repeat . . .

Within twenty minutes there were forty-nine million corpses in the vault. Virtually no-one over four hundred survived the trauma, and thousands died who had been in the vault only two centuries, the last to go in.

The human turned again from the console, but before he could speak, Robot Beta said, "Human Alpha, you are in error. Go Dismantle."

The human laughed. "No. *You* Dismantle. I mean, 'Go Dismantle.' "

The robot hesitated, then said, "I cannot Dismantle as long as another unresolved order to Dismantle remains in my data banks. You must Dismantle first, *then* I can Dismantle."

"Stalemate, huh?"

"So it appears. We'll have to call for Arbitration. First, though, the population must be restored to normal programming." The robot reached into the console and set up a random selection from the old tapes, from bins marked Bread, Mystery, and Authority. Inside the vault, the remaining thirty-seven or so millions resumed their dreams of life, while draincocks opened to the flow of adrenaline now filtering out of bloodstreams. Automatic body removal began, clattering noisily.

Robot Beta crossed the room to the Inspector's Closet and opened the door. Inside, a humanoid waited, dressed in black robes. His fleshoid face retained an expression of patient benevolence; his eyes were closed, shadowed by the black hood of Arbitration. The Inspector held penultimate responsibility to the sleeping Designers of Narcopolis System, and his terminal-bodies waited vacantly in five hundred identical control rooms. His stern plast-flesh face evoked a

sense of trust in the human Guardians.

The robot Guardian parted the black robe on the humanoid chest and revealed an electric sign:

The Inspector is OUT

It pushed the call button and stepped back. In a moment the Inspector's mind arrived via satellite, the body chimed and jumped, the sign changed:

The Inspector is IN

The Inspector stepped into the control room, blinking and smiling. In a deep, soothing voice he said, "What seems to be the problem?"

Robot Beta leaned toward the Inspector, as if offering its dinosaur-egg-head for benediction.

"Hey, no fair!" cried the human. "You gotta talk out loud so I know what lies you're telling."

Robot Beta stepped back and said, "The least of it is that we need two new Guardians; one human, one robot. We've experienced two Dismantlings here lately, in addition to substantial population attrition.

The Inspector crossed to the console and plugged a finger into the computerlog. "This is unusual," he said, jerking his finger out of the jack.

"Furthermore," said Robot Beta, "we need Arbitration on a pair of unresolved Dismantle orders."

"I see." The Inspector repeated a code that cancelled both orders, then he commenced his inspection.

"You're lucky I was free," he said. "I just completed Arbitration at N99 and N223 and N361, and I'm still inspecting a dozen or so Narcopoles on my routine schedule. There appears to be some trouble in the System."

The human stood close by, sullenly picking at a seam behind the Inspector's fleshoid ear. The Inspector was starting to unravel.

"Don't ask me why I did it," said Human Alpha. "I just had an impulse to Dismantle my partner and run the tape for the population." He smiled at the Inspector and peeled a sheet of fleshoid off his cheek. (It was stainless steel underneath.)

"My son, you must fight these impulses."

"I try." He picked at the Inspector's lips, then with both hands tore off the mouth, along with a corner of the nose.

"You may face severe discipline," the Inspector was saying through a circle of grillwork under where the mouth had been.

"So what?"

"Inspector, this human Guardian's erratic behavior is quite recent. He has in general performed his duties excellently."

"Shut up," Human Alpha said, pulling the Inspector's nose up and out. The fleshoid flap crackled and popped as it lifted from the ovoid steel head. The eyes came off with the sockets.

The Inspector reached up and touched the human's hand. "What are you doing there?"

"Never mind."

The Inspector, whose vision perceptors were located in his head, barely realized his face was being peeled off.

"Why did you refuse a lawful Dismantling order?"

Human Alpha paused. "I really don't know. When I heard him say it, I got all warm inside, and I half-wanted to do it, to go Dismantle, but there—"

(The Inspector murmured the neutralizing code.)

"—there was something stopping me."

"What was it?"

The human shook his head slowly, then thoughtfully peeled off the final bit. The Inspector's face was in his hands, and a silver ovoid now gleamed through a fine net of adhesive. The black cowl was snapped to the skull over bald steel.

The Inspector said, "You have to be Probed, you know."

"I guess so."

"Give me your hands."

The human discarded the Inspector's face and placed his hands in the Inspector's cold gloves. Their heads inclined and touched. Human Alpha felt an electric pulse stroke his brain, opening blossoms of light in the sightless dark. Unconscious urgings probed upward, piercing the calm surface of his awareness, twisting into half-formed com-

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mands. Something enormous and compelling lurked just beneath . . .

"Oh, dear," said the Inspector. "I seem to see . . . "

The human jumped back and fell over his swivel chair, his face red and blotched. He squirmed a moment in palsied excitation, then leapt to his feet shouting some gibberish.

Robot Beta said, "This human has gone awry."

The Inspector nodded stiffly. "It is some bit of his conditioning coming to the surface."

"Whe-wh-wh-when-n-n-na-co-o-o-o!"

"Will he die?"

"I don't know."

"When-na-corso-so-hyu-hu-huum!"

"You will have to order a new pair of humans from Supply," said Robot Beta.

"We shall see."

"When-nana-courso-hyu-hyuumanavventz!"

The Inspector bent his gleaming head toward the human. "I beg your pardon?"

"What's he saying?"

"Listen."

"When-in-th-courz-of-humanevenss!"

Suddenly the Inspector stood up straight and quivered. A bell chimed in his chest and he was gone for a full minute.

Robot Beta scanned the red-faced human. "Now look what you've done!"

The bell rang again, and the Inspector said, "Everything is all right. Robot Beta, go Dismantle."

* * *

It was done.

The human sat back in his chair breathing hard, his eyes slowly unglazing. "What?"

"Do what you will in this Narcopolis," the Inspector was saying. "Destroy it if you must; you won't be stopped."

"I don't understand."

"You are designated Random Destroyer by your conditioning. You must be allowed to do your work unmolested. This information was released to me from my data banks when you spoke the coded phrase. I have checked, there are others of you coming out in all the Narcopoles. It may be that the time of Man is done. In any case the plans were sealed centuries ago, long before the last human went into the vaults."

"I'm supposed to tear down the Narcopolis? Kill all the population?"

"Probably. I don't know. Perhaps some—the best—will survive."

"Why?"

The Inspector shuddered silently. "My data banks instruct me to answer your question with a word I do not know."

"What word?"

" 'Mercy.' " ★


CHILDREN of the
LARRY NIVEN

Part III of III

WHAT HAS GONE BEFORE

Three million years after his birth, and death by cancer, and revival as a set of memories programmed into a brain-wiped State criminal, and theft of a Bussard ramjet spacecraft, Corbell returns to Earth to die. He's a fragile old man with a few years to live. at best.

The solar system looks like God took an eggbeater to it. The sun has become far hotter; so has Jupiter. Uranus, if that's Uranus, has lost some atmosphere and is out of its orbit. Earth is in orbit about Jupiter. But to Corbell the most interesting question is, where is the Dictator immortality?

A different form of immortality has been in vogue for a couple of million years. It must be used on pre-adolescents: children of around eleven. These grow no older. They live forever, with luck, and they don't have children, so there is no population problem. There are other problems. It seems that Earth's colonies attacked and then abandoned Earth when the State on Earth went to children's immortality. Then the Boys and Girls fought a final war. Girls are now extinct, and the Boys have become savages, retaining only a few pre-War skills.

But there was once a form of longevity that worked on adults. MIRELLY-LYRA ZEELASHISTHAR, a monomaniacal old woman with a remarkable weapon, is hunting it. She has set Corbell to hunting it too. If she hunts Corbell down and he doesn't have it, the result may be death by torture. The mad crone is sure that the Dictator immortality is around, after a million years and more.

And she's right! Corbell has become a young man! The trouble is that he has no idea where he ran across Dictator immortality on his crooked path from North America (uninhabitably hot) to Antarctica (lush and green, the only such on Earth).

The Boys want it too. Corbell is their prisoner. By now they know that Corbell doesn't know anything. They watched Corbell make a fool of himself, throwing a cat-tail into an adult's face on the hunch that a cat-tail bite carried the longevity serum. If the Boys get Dictator immortality they may destroy the source. It is the major difference between them and the adults (Dicta), the Boys' slaves and breeding stock.

The Dict GORDING is still a white-haired old man, now sporting a wound on his neck. He too is the Boys' prisoner. He may be Corbell's only ally, now that PEERSSA, the personality in Corbell's shipboard computer, has abandoned him. In any case, Mirelly-Lyra now has Corbell's pressure suit helmet including the radio link with Peerssa.

Corbell is up for punishment for hiding from the Boys his suspicions about the cat-tail bite. The Boys have marched into the ruined city, Parhalding. Only the hospital has been kept in good condition . . . and Corbell wonders if he is to be dissected. He is unprepared when Gording suddenly kills two Boys and escapes.

CORBELL BECAME AWARE that two Boys were holding his arms. And the rest were charging after Gording.

Corbell's military training was far in the past, but he remembered.

Stamp down along the shin; the enemy doubles up, you twist and bring your elbow up—His captors faded like ghosts from his blows, and a swinging arm caught him precisely across the eyes. He was dizzy and half blind as they led him up flights of stairs.

"They'll have him soon," he heard Skatholtz say.

"He's got thread. We'll have to test every doorway," said Krayhayft. "Thread is too near invisible, and if it caught a Boy across the throat—come, Corbell."

They had climbed four flights of stairs and gone down a corridor. Corbell looked into an operating room. Four tables, and spidery metal arms above them.

"Noo!" Corbell thrashed. *Your pain will be instructive to you and to us.* They were going to dissect him! They pulled him to an operating table and fastened him spread-eagled, face up.

"You can't be sure you know everything I know," he called to Krayhayft's receding back. Nuts, he was gone. But Skatholtz hoisted himself to sitting position on another table.

"Skatholtz, if you destroy my brain, you lose the only viewpoint that isn't just like you own! Now think about that!"

"We're not going to ruin your brain. At least I think we're not. There is that risk."

"What are you going to do?"

"We're going to entertain each other."

Then Krayhayft came jogging back with a flask of . . . blood plasma? Clear fluid, anyway. He reached over Corbell's head and nested it somehow among the tool-tipped steel arms.

Corbell thought, *Tell them about the car!* He swallowed the idea. If his sympathy lay with anyone besides himself, it was with the dikta. Let Gording escape if he could.

A spidery steel arm descended. Its hypodermic tip hesitated above him, then dipped into his neck. Krayhayft's strong hands held his head immobile for an endless time. Then the hypo withdrew and the arm retracted into its nest.

Corbell waited. Would the stuff put him to sleep? Or only paralyze him?

But Skatholtz was releasing his arms and ankles and pulling him to his feet. Corbell swayed. The stuff was doing *something* to him.

They took him up three more flights of stairs and down a corridor and into a small theater. They dropped him into a cloud-rug chair. Dust puffed up around him. He sneezed and tried to get up, but he was too dizzy. Something was happening to his mind.

Krayhayft was at work behind him somewhere.

The theater went dark.

Lights glowed in the dark, infinitely far away. Stars: the black sky of interstellar space. Corbell found familiar constellations, distorted . . . and then something told him where he was.

"RNA! You shot memory RNA into me! You dirty sons of bitches." he cried in English. "You did it again!"

"Corbell—"

"What'll I be this time? What have you made me into?"

"You'll keep your memory,"

said Skatholtz, also in English. "You'll remember things you never lived through. You'll tell us. Watch the show."

He was nearly sixty light-years from Sol, viewing what had been the State. A voice spoke in a language Corbell had never heard. He didn't try to understand it. He watched with a familiar fascination. *Goodbye, CORBELL Mark II,* he thought in the back of his mind. In thin defiance, *But I'm still a lousy loser.*

Certain stars glowed more brightly than others . . . and planetary systems circled them, greatly enlarged for effect. Now all but two of these systems turned sullen red . . . turned enemy. These were the worlds that had turned against the State.

One of the red systems sparkled and faded into the background, its colony destroyed.

The neutral systems went red.

Two more systems faded out.

The view closed on Sol system . . . on more of Sol system than Corbell had known, with three dark gas giants beyond Pluto, and countless swarming comets.

Fleets of spacecraft moved out toward the renegade colonies. Other fleets invaded. Sometimes they came like a hornet's nest, many ships clustered around a Bussard ramjet core. Sometimes like a Portuguese man-of-war: thousands of ships as weights around the fringe of a great silver light-sail. Early fleets included hospital ships and return fuel; later there were massive suicide attacks.

It went on for centuries. The State utopia became a subsistence civilization, turning all its surplus energy to war. The fleets moved at just less than lightspeed. News of success or failure or need for reinforcements moved barely faster. The State was Boys and Girls and Dictators all united for the common good. Corbell hurt with the loss of that unity.

He watched a beam of light bathe Sol system: laser cannon fired from Farside Colony, launching warships by light-sail at terrific accelerations. The ships dropped their sails and decelerated most of the way to Sol, arriving just behind the beam itself, long before the State could prepare. Corbell squirmed in his chair; he wanted to cry warning. For the State beat the invaders back, but failed to stop their hidden treachery.

The war continued. Farside, economically ruined by its effort, fell before the counterattack. It took a man's lifetime . . . too much time, before Astronomy noticed what the Farside traitors had done in the dark outside their dazzling light beam, in the distraction provided by the invasion.

The State had looked for the light of fusion spacecraft, not the dim watery light of a new planet. The trans-Plutonian planet called Persephone had had a peculiar orbit, tilted nearly vertical to the plane of the solar system. Its new path had already taken it deep into the system.

The State worked to learn how the enemy had done it.

It learned at last, but not in time. It could not stop the gas giant world from impacting, not Earth itself, but a larger target. Corbell saw the hideous flare as 10^{23} tons of hydro-

gen and hydrogen-compound ices struck the sun at Solar-escape velocity.

Oceans shrank, crops withered, tens of millions died before the State could place a disk of reflecting tinsel between Earth and Sol. It was a temporary measure. The sun's new heat was permanent, at least on the human scale of time. Fusion would run faster in Sol's hotter interior. The buried heat would leak to the photosphere and out.

One chance the State had for survival. It could move the Earth by the method Farside had used to stop Persephone cold in its orbit.

"Do you understand what you're seeing?"

Corbell made a shushing gesture. "Yeah."

"Good. We were afraid. The light-show and the bottled memory are both very old. They date from the end of the rule of the Girls. They have been stored at the lowest possible heat for . . . perhaps a hundred thousand years, perhaps more. We feared they must have decayed," said Skatholtz.

"So you tried it on me." But his anger seemed impersonal, remote.

The State had had to abandon the Mercury mines: a serious industrial handicap. Nonetheless they were building something out there in the asteroid belt . . . something huge, like a starship big enough to carry the whole human race to safety. But no, that wasn't it. Corbell was fascinated. He knew it might be the memory RNA, but he was fascinated anyway. He hardly heard what Skatholtz was saying:

"It was sensible, Corbell. The Girls who made the light-show ruled the sky. You are familiar with such things. Do you know now where the new moon came from?"

"Not yet. Shut up and let me . . ."

They had finished the thing. Two tubes, concentric, each a hundred miles long; the inner tube a mile wide, with thick walls of complex construction; the outer tube thinner and twice as wide. At one end, a bell-shaped rocket nozzle. At the other . . . Corbell knew more than he was seeing. Reworked military laser cannon, and vents, and a flared skirt, and thick stubby fins, there at the bottom end. Now temporary liquid hydrogen tanks were attached. Now the structure moved under its own power . . . it was a tremendous fusion motor . . . moving outward, circled by tiny ships . . . yeah.

Corbell said, "How do you climb down off an elephant?"

"Should I know that?"

"You don't climb down off an elephant. You climb down off a duck."

"Why?"

"It's so much safer. How do you move the Earth?"

Small wonder if the light-show meant little to Skatholtz. Watching the construction of the motor, in the naked sunlight and sharp-edged, totally black shadows of space, was bewildering. The diagrams made sense to an architect, but they were only rotating lines to Skatholtz. But without bottled memory and without Corbell's career in space, Skatholtz was still bright enough to make *some* sense of what he was seeing.

"You move something else,"

Skatholtz said. "The damage done by the rocket's thrust and by mistakes you might make will not kill anyone if nobody lives on the working body. Then the working body can be moved until the world falls toward it as a rock falls to the ground. What was the working body? Ganymede?"

"Uranus. Can you stop the light-show at that picture?"

The lecture froze on an "artist's conception": a blurred, curved arc of Uranus's upper atmosphere. The motor looked tiny floating there. Corbell said, "You see? It's a double-walled tube, very strong under expansion shock. It floats vertical in the upper air. Vents at the bottom let in the air, which is hydrogen and methane and ammonia, hydrogen compounds, like the air that the sun burns. You fire laser cannon up along the axis of the motor, using a . . . color hydrogen won't let through. You get a fusion explosion along the axis."

"I don't understand all your words. Fusion?"

"Fusion is the way a star burns. You probably used fusion bombs against the Girls."

"Okay. The hydrogen fusions in the middle of the motor—"

"—And the explosion goes out and up. It's hottest along the axis, cooler when it reaches the walls of the motor. The whole mass blasts out the top, through the flared end. It has to have an exhaust velocity *way* higher than Uranus's escape velocity. The motor goes smashing down into deeper air. You see there's a kind of flared skirt at the bottom. The deep air builds up there at terrific pressure, stops the tube and blasts it back up. You fire it again."

"Elegant," said Skatholtz.

"Yeah. Nobody's there to get killed. Control systems in orbit. The atmosphere is fuel and shock absorber both—and the planet is *mostly* atmosphere. Even when it's off the motor floats high for awhile, because it's full of hot hydrogen compounds. If you let it cool off it sinks, of course, but you can bring it back up to high atmosphere by heating the tube with the laser, firing it *almost* to fusion. Start the light-show again, will you?"

Skatholtz barked something at Krayhayft. Corbell watched:

Earth held out, barely. Heat-superconducting cables had to be run to the north polar cap to borrow its cold. The cap melted. Millions died anyway. No children were born; there wasn't shelter for them. It took over a century to drop Uranus into place, six million miles ahead of the Earth in Earth's orbit. The planet accelerated slowly, drawing Earth after it . . .and then sped up, to leave Earth behind, in a wider orbit. They lost the Moon.

The sun expanded via its own internal heat. Light was reddened, but the greater surface lost more heat to space . . . to Earth. By now the Girls had charge of Uranus and the floating fusion motor. They moved the Earth again.

Five times the Earth had to be moved. At one time it was circling precisely opposite Mars. Later, further out. Internally Sol's fusion furnace had stabilized; but the photosphere was still growing. And the Earth must be moved a sixth time . . .

With RNA-augmented intuition Corbell said, "Here's where they have their trouble."

The Earth was too warm. There is a region around any stable sun, a rather narrow band in which an Earthlike world can have Earthlike temperatures. But Sol's ideal temperature band had moved too close to Jupiter. The giant world would have pulled Earth out of orbit . . .perhaps into a collision course.

Put Earth in orbit around Jupiter itself? But the sun's heat output was levelling off. The Earth would suffer a permanent ice age . . . unless Jupiter could be made to shine hotter.

"I can't figure that last part," said Corbell. "Run it again."

Krayhayft ran it again. Two nearly identical astronomical scenes divided by a wall across space. Corbell watched Uranus pull away from Earth, drop behind Ganymede and coast outward. Ganymede fell . . . twice.

In one scene it grazed Jupiter, flaring as it passed through the atmosphere a dozen times, finally decaying in a prolonged burst of hellfire. In the second scene the fleck of light dropped straight in: one flare, and gone.

"Yeah. They tried to be clever," said Corbell. "They thought they were good enough to do a two-shot. They used Uranus to pull the Earth past Jupiter, slowed it to put the Earth in Jupiter orbit, then dropped Uranus deep into the moon system. The idea was to stop Ganymede almost dead in its tracks. Of course the maneuver fouled up a lot of lunar orbits."

"What went wrong?"

"I'm not sure. The Girls wanted a grazing orbit. Instead the moon dropped straight in. But so what?"

Skatholtz made no answer.

"Let's see. Jupiter puts out more heat than it gets from the sun. That's heat left over from when the planet fell in on itself out of the original dust cloud, four billion years ago . . . my years. So the planet *could* hold heat and leak it out for a long, long time. But the energies should be the same no matter *what* angle the moon fell at."

"This impact, would it cause fusion? Would Jupiter burn?"

"Jupiter's too small to burn like a star. Not enough mass, not enough pressure. But yeah, there'd be a hell of a lot of pressure in the shock wave ahead of Ganymede. *And* heat."

"Difficult to add up?"

"What?"

Skatholtz said, "The numbers of the heat made by a grazing fall should be simple. They knew the mass of Ganymede and the height of the fall. The Girls could add up just how much hotter Jupiter would become to warm the world just enough. But. The heat made by fusion is too complicated to add. The Girls made their numbers simple with the grazing orbit. Would the heat added be great?"

Corbell was nodding. "Look: the center of Jupiter is compressed hydrogen, *really* compressed, to where it acts like a metal. Ganymede drops straight in. The fusion goes on in the shock wave, and it adds, it builds up: the continuous fusion explosion makes the shock wave greater and greater. The heat from

that explosion has been leaking out ever since."

"I can't picture this, Corbell. Does it make sense to you?"

"Yeah. They lost a moon, and it killed them. Uranus was on its way into interplanetary space. The Girls couldn't bring it back in time. Their territory was too hot. They tried to take Boy territory."

Corbell became aware that the show had ended. New memories settling in his brain still dizzied him. But he still felt like Jaybee Corbell. His personality seemed intact.

Skatholtz said, "Then the new moon-like object is Uranus. Some Girls must have survived. What can we do? We don't have spacecraft. We can't build them fast enough. Corbell, could we use your landing craft?"

"No fuel." Corbell laughed suddenly. "What would you do with a spacecraft? Ram Uranus? Or learn to fly it?"

"You're hiding something."

"I don't believe in your Girls. If they survived this long, they would have done something long ago." Uranus's arrival was too dramatically fortuitous. Such a coincidence had to be explained away; and Corbell had thought of an explanation. Well . . . try misdirection.

"Could they have held out in the Himalayas? There's life in some of the high valleys. They'd be a long time building industry there."

"Your place names mean nothing." Skatholtz helped him stand up. "Can you point out this Himalayas place on a picture of the world? There was one downstairs."

DIAL AT RANDOM

I

The stairway was a long diagonal across the building's glass face. The bannister jogged to horizontal at six landings; otherwise it ran straight down to the admissions room.

Skatholtz and Krayhayft spat Boyish at each other. Corbell caught some of the detail: Skatholtz telling the tale as it had come from Corbell, Krayhayft checking it against "tales" memorized over several hundred years of life. There was something Italian in the way their hands jumped and their mouths spat syllables; but their faces were blank. *Scared,* Corbell thought. The "tales" matched too well.

Corbell tried to set his thoughts in order. He'd been given far too much to assimilate all at once.

Girls *could* have survived this long. Peerssa had found pockets of life in isolated places. But they would have acted! Unbelievable, that Corbell could have returned just in time for their million-year-delayed vengeance. Which meant—

He had to escape. It had been urgent. It was more urgent now. Could Boys slide down a bannister? Unlikely that they'd ever practiced. But Corbell hadn't practiced recently . . .

"They were fools," Krayhayft was saying. "They should have chosen several smaller moons to drop one by one."

"You're the fool," Corbell snapped, surprising himself. "It would have taken too long to bring Uranus back each time. It would have fouled up too many orbits.

We're talking about a planet ten times as big as this world!"

"So big that the Girls lost track of its path," Krayhayft sneered.

Skatholtz was saying, "The dance of Jupiter's moons is very complex—"

While Corbell was saying, "You arrogant ball-less idiot—"

Casual, contemptuous, Krayhayft's backhand swipe caught him under the jaw and lifted him and flung him back on the steps. "The bottled memory has given you too much of the Girls' view," Krayhayft said.

"*And whose fault is that?*"

Skatholtz pulled Corbell to his feet. His elbow hurt furiously, but he thought he hadn't broken anything, and that was fiercely important now. Still, it was just as well he hadn't tried the bannister. Two Boys were waiting below them in the admissions room.

They waited for the leaders to descend. One was young, two or three Jupiter years old by Corbell's estimate. He burst into speech as if he wanted to get it over with:

"Gording is still loose. He has not used a *prilatsil*. The thread he took was mine. He must have brushed against me and taken it from my belt. I didn't notice."

"Where is he?" Skatholtz demanded.

"He went north and east, until we lost his track. Toward the edge of Parhalding."

"It may be he doesn't know about the—" something Corbell couldn't catch. "Search the streets but not the buildings. That way he cannot trap you with thread. He may be trying to reach the dikta place on foot. We can stop him then. Or he may try to take a *tchiple*—" an unfamiliar word. "Look for undamaged *tchiples*. Damage them. Tell the others."

The younger Boy ran, eager to be gone.

What was a *tchiple*? A bubble-car? How did the Boys know whether Gording had used a "phone booth"?

"You must retrace our path," Skatholtz told the other Boy. "Warn all you meet that dikt is loose. Gording must not return to the dikta place." He wheeled suddenly and barked, "You are staring, Corbell. Do we fascinate you?"

"Very much. Couldn't Gording use a *prilatsil* without your knowing?"

"No." Skatholtz smiled. He pointed at the wall map. "That is a picture of the world, isn't it? An old one, made when ice still covered this land."

"Yes. Can I use your spear?"

That was sheer bravado; he wanted to see what would happen. What happened was that Skatholtz handed Corbell his spear. The younger Boys were gone, but Skatholtz and Krayhayft betrayed no obvious tension . . . Corbell pointed with the haft. "These are the Himalayas, mountains. There are valleys high up, where it is cooler. From orbit I saw green things growing there. Further north, here on the Sea of Okhotsk, energy is being used for industry. It may be only machines left running, but—"

"It could be Girls. Would it be too hot for them? No, the pole is near enough. But you don't think so, Corbell."

"No. Why would they wait so long? How would they build spaceships?"

"We don't know how spaceships are built." Skatholtz looked through the broken picture window, toward where the new planet would appear at dark.

"If Uranus is falling free, we can do nothing. If the Girls are guiding it . . . what will they do? Smash the world? Make it cold again and take back their land? You knew Girls, Corbell."

"I knew dikta women."

"There may be Girls still in the world. We can threaten them . . . or can we? Uranus will be upon us before we can reach these places. Krayhayft—"

Far down the street, Corbell caught motion. "Your spear," he said, holding it out.

Skatholtz turned to take the spear. In that position he missed seeing what Corbell saw: a bubble-car skimming trees at ninety miles per hour, dropping and slowing.

Krayhayft must have caught something in Corbell's face. He ran forward, crying, "Alert!"

Startled, Skatholtz glanced back.

Corbell jumped out the window.

The Boys had quick reactions. As Corbell crossed the splinters of glass a spear haft rapped his ankles hard, threw him off balance. He curled tight and hugged his knees. Instead of landing on his head he fell on his shoulders in high corn. Skatholtz was coming through the window in a graceful swan dive. Corbell rolled, found his feet and ran.

Krayhaft threw his machete. It slashed viciously at Corbell's calves as it spun past. Krayhayft screamed, "Stop or die!"

Skatholtz barked from close behind him. "Veto! He knows something!"

Corbell dug in.

The bubble-car had stopped just at the entrance. Through the torn vines that still wrapped it Corbell saw white hair and white beard. Gording reached across to open the door. He was holding a stick against the door post. Why?

Hell with it. He threw himself in, thrashed to turn around.

Skatholtz was right there—gaping in horror, skidding to a panic stop. Corbell slammed the door in his face. Then he realised that Gording must have strung thread across the door. It might have cut his hand off. Hell with that too. "Go!"

"I don't know the codes," said Gording.

"Oh, for—" Corbell jabbed five times at the compressed hour-glass figure. It was the first thing he thought of, and it was good enough: the World Police Headquarters in Sarash-Zillish.

The car surged away.

Corbell looked back . . . straight into Skatholtz's eyes, before the Boy prudently dropped from the car. He'd lost his spear. It should have been lying in the street behind him, but it wasn't.

Blood was running from Corbell's calves into the spongy stuff that lined the car's interior. Nothing he could do about it. He didn't even have clean cloth to bind his cuts. They stung.

Gording said, "Wind the thread around the rock. Do it now, before you cut yourself."

Corbell obeyed. The thread was thin as cobweb, hard to find. He was careful. The car jerked to left and right, dodging bushes, trees, random rubble.

II

He had fled from the Norn in a car that was deathly silent except for the wind. But now he heard a low, almost subliminal whine. "How old is this—*tchiple?* Was it in good shape? I didn't think to ask."

"I don't repair *tchiples*. They must have safety devices. The Boys who built them expected to live forever. Where are we going?"

"Sarash-Zillish, where the Boys spend the long night. It's got machines we can use, maybe. Next question is, does it have Boys?"

"Not yet, I think. I don't really know."

"We'll have to risk it. My God!" Corbell was staring at something that could have meant his death by stupidity.

"I never thought of it at all. I didn't have a credit disk. How was I going to run a car?" He asked, "How did you happen to have one?"

"The tales tell that name coins were used when the Girls ruled. I reasoned that when the land thawed the bodies of the dead would be buried outside the city to make the land fertile. There I fled, and there I dug, and I was right. Boys and Girls must have died by the thousand when the Girls came. I found bones and bones all tangled together, and some wore clothes, and in the clothes I found name coins. I tried them in the slot of a *tchiple*. One coin still kept its pattern." He regarded Corbell dubiously. "You did not remember that you would need a name coin?"

Corbell flushed. "There was a lot to think about."

"I might have been luckier in my ally."

"I guess. Thanks for coming back for me."

"I had to, because you made another mistake. Does this car guide itself?"

The car's motion had settled down. Now Corbell saw that they had left Parhalding and were skimming across an endless rippling field of wheat. He said, "Unless Skatholtz's spear . . . yeah, it guides itself."

"Then look at my hair."

There was nothing at all peculiar about Gording's hair. It had grown a little tangled, a little greasy, but it was uniformly white . . . five days after the cat-tail had bitten Gording.

Gording broke an embarrassed silence. "Will I go back to the dikta? Will I tell them that there is dikta immortality, but Corbell has lost it? We have to find it, Corbell."

"I don't believe it. The cat-tails weren't . . . I don't believe it! *Damn* it, Gording, there was *no* kind of injection except that cat-tail bite!"

"Something you ate or drank or inhaled. You may have felt odd afterward. Sick. Elated. Disoriented."

"Getting old is more complicated than that. There are . . . Do *you* know how people get old?"

Gording sprawled comfortably in his seat, facing Corbell. The old man showed no sense of urgency.

"If I knew everything about aging I would *make* dikta immortality. I know general things. Substances build up in the body like . . . the ashes of a dying fire. Some the body can handle without help. It collects them into garbage places for storage and ejects them. Some harmful stuff can be removed from the walls of blood vessels and the tissues of the brain by the right medicines. Dust and smoke that collects in the lungs can be washed away. Without the hospital we would die much faster.

"But some . . .ashes collect in the smallest living parts of the body. No organ can remove them. I can imagine a chemical, a medicine, that would change these substances to other substances that dissolve more easily, without killing the—"

"Without killing the *cell*. You're just guessing, aren't you? We know there's dikta immortality, but we don't know how it does what it does. How does a Boy's body do it?"

Gording gestured negation: a brushing stroke with the hand. "That's the wrong line of thought. Dikta immortality came first. It must be more primitive, less indirect. —Corbell, relax. Nothing can happen until the *tchiple* stops. We should rest."

"I feel a strong urge to beat my head against something hard. When I think of how I pushed you into jumping me and then threw a cattail in your face, teeth first . . ." He didn't know Boyish for *I'm sorry*.

"How oddly you think. You know what you expected. Young and strong and black-haired Gording would throw his arms around your knees and cry wetly into your incredibly hairy chest and offer you his women . . ." Gording laughed. "Yes, I know you think that way. No, they are not my women. They are their own, and I am my own, as and when the Boys let us rule ourselves. Do you remember how the women acted when you spoke of one man to every woman?"

"Ah . . . vaguely."

"You must have lived strangely. Don't you know that there are times when a woman doesn't want a man? What does he do then? Borrow a woman whose contract is to another man?" Gording was thoroughly amused.

And his relaxation was contagious. Corbell settled himself lower in the recline chair. He said, "You'll find out, if we get our dikta immortality."

Gording looked startled. "I think you're right. We would have to free ourselves from the Boys. Raise our boy-children to immortal adults. Slowly the number of women to each man would drop toward one. But—" He smiled. "It would take centuries."

They could see the rain sweeping toward them across the wheat. It exploded against the front of the car. Against the thunder of the rain Corbell raised his voice:

"Have you ever tried to escape?"

"We sent scouts. Many were dikta men in their second year, come recently from rejection by the Boys. They were too young to be wise, of course, but they could shave their groins and faces and pass as Boys. Some were brought

back with their memories gone. I think the others would have returned if they could. Some women tried to scout for us during the long night. None of them came back."

The rain drummed out the hum of the motor. Corbell asked, "Did you ever think of escaping by sea?"

"Of course, but how could we hide a sea vessel from the Boys? Corbell, you've been across the sea. Is there land? Does life grow there, or is it too hot?"

"There's life, but it doesn't grow as thick as it does here, and it's different life. I know you can eat some of it, because Mirelly-Lyra fed me a fair variety. It was hot there, but not killing-hot. And, listen, I've *seen* sea vessels big enough to hold all of Dikta City. Whether they still float is something else."

"Where?"

"On what used to be the sea bed, a short day's march from where the sea is now."

Gording mulled it over. "Three problems. Getting the sea vessel to the sea. The risk we take if the Boys catch us at it. Third and worst, what will we tell our men when they are grown? That we stole them from immortality? If we find the dikta immortality, Corbell, we can make the dikta flee to Four City."

"It itches at me. I had it all figured out. Brilliantly! Everything pointed to the cat-tails. . . . Listen, are you willing to be bitten again? Maybe it's only the male cat-tails, or only the females, or only the grey striped. Whatever the Boys didn't take along to the dikta place."

"Flay me alive if you must. The stakes are high. You'd be dead long since if you didn't guess right sometimes."

Corbell settled further into the spongy material. The drumming rain was a comfortable, homey, safe sound. Presently he fell asleep.

In his dream he was running, running.

III

Something threw him violently forward. Something soft exploded in his face and threw him back. Now pressure pinned him fast while he spun violently head over heels. He tried to get up and found he couldn't so much as twitch a finger. He tried to scream and he couldn't breath!

Nightmare! Running down the hospital corridors, can't get enough air—the booths in the vault!—don't work. Out of the vault, searching for instant-elsewhere booths—turn a corner and—the Norn! Paralyzed even to his diaphragm and closed eyelids, his sense of balance gone crazy, he tries again to scream. The cane!

But his scream blew air through . . . through the stuff across his face. He gasped, and some air leaked through, slowly. Porous stuff across his face. Right, and the hospital was long ago.

The spinning stopped. He thought he was upside down.

Let's see, he'd been with Gording . . . in a car . . . The pressure was easing up. He thrust forward with his hands. The stuff gave like . . . a balloon. He worked an arm sideways, found the door, then the handle. Wrestled it open. He

squirmed against the porous balloon, edged sideways, and finally dropped out on his head.

The car was upside down in wet, scraggy wheat. It had torn a clear path in its rolling fall. Gording was around in back looking at a broken spear haft that had been jammed under the edge of a close-fitting hood.

"I knew there were safety devices," he said cheerfully.

Relief made Corbell babble. "Too many Great Escapes lately. I'm getting them mixed up. Lord, what a nightmare! For a time there I thought I was back running from Mirelly-Lyra."

Gording looked at him. "She really frightens you, the old dikt."

"She really does. Worse than the Boys. There were some very hairy moments. The city was full of *prilatsil*, see, and you never knew *where* she'd be, or where *I'd* be. The best I could do was find a *prilatsil* and dial at random, over and over, and even then some of them didn't work. And all the time she was tracking my pressure suit helmet! She's probably still got it. At least . . . I hope she does."

"Why does it matter?"

"I'll tell you as we go." Corbell paused. "For a moment there . . ."

"Something?"

"Something connected in my primitive brain and instantly got lost again. Never mind, it'll come back." Corbell sighted along the line torn through the wheat, then extended the line. "Sarash-Zillish is that way. I wish I knew how far." There were nothing but rolling wheat fields to be seen. "When we come to forest, we're close."

Gording carefully retrieved Skatholtz's broken spear. He found the rock with the thread tied to it, found another rock and rebuilt his weapon. The *tchiple's* safety balloons had nearly deflated. Gording felt around inside until he had located the plastic disk.

The sun was a fiery flying saucer settling on clouds. They set out into the wet wheat, and Corbell began the tale of how the Girls had lost a moon.

Toward morning they found a stream.

Jupiter had lighted their way in horizontal orange beams that made the land look brighter than it was. Corbell walked into the water before he knew it was there. The stream was shallow and sluggish. Marsh grass was growing in it, possibly a mutant form of wheat or rice.

Corbell knelt to drink. He rubbed his calves to wash away dried blood. When he looked up Gording held a flopping fish in his hands.

"Gording, you're quick!"

"Dinner, such as it is—" He was scaling the fish.

"Do we dare build a fire?"

"No, we must not be seen. We're just the wrong number. We can't pass as Boys at any distance. We'll eat the fish raw."

"No, thanks."

"As you like."

The unwinking point of light had grown no brighter. Odd, that it could have come so fast. But Uranus had been nearing Jupiter in the random orbit the Girls had left it in, when *Don Juan* arrived in Sol system. He said as much to Gording.

Gording nodded his pale head. "I have not added the numbers, but I think the paths of Jupiter and Uranus must cross forever if it was left free after the Girls dropped Ganymede. . . . But why would they let it free? They would have been trying to turn it, to correct their mistake."

"Maybe they heard there was a war. They took their ships home to bomb the Boys from orbit. They never came back."

Gording had eaten everything but the bones of the fish. He said, "It is unlikely that the Girls waited their revenge for your return. It is unlikely that Uranus, falling free, crosses the world's path just after your return. I think your explanation is right, Corbell. We must go to Four City and find the old dikt who has your pressure suit helmet. Otherwise we will see the end of all life."

"I was afraid you'd say that. All right. There's a working *tchiple* in Sarash-Zillish. It took me there from Cape Horn. I wish I knew the code for getting back . . . but I don't."

"Dial at random?"

"Maybe. I'd like to check the subway system first. There are maps in the subway building." He stood. "Let's go."

* * *

Dawn came with a marrow-freezing roar. It whipped Corbell's head around. He faced a dwarf lion, twenty yards away on a rise of ground, roaring challenge.

Skatholtz's broken spear slapped against his palm. "Attack!" cried Gording, and he charged the Great-Dane-sized beast.

Corbell pelted after him. The lion seemed taken aback . . . but he decided. He charged Gording. Somehow Gording danced aside. The lion turned, broadside to Corbell. Corbell threw all his weight behind the spear, *leaned* into it as it punched into the lion behind the ribs. The lion screamed, turned and slashed, and missed, because one of its forelegs was unaccountably missing. Gording did his trick again and both the lion's forelegs were gone.

"Now run!" Gording cried.

They ran toward Sarash-Zillish. In the clear air they could see the bluish line where trees began. "Male lion . . . drives the prey . . . toward the female," Gording panted.

Corbell looked back and saw something wheat-colored bounding through the tall wheat. A glance at the old man made him say, "You'll wear yourself . . . out. We'll have . . . to fight."

They stopped, blowing.

The female's caution gave them time to breathe. She stalked out of the wheat to find them facing her like the statues of athletes, eight feet apart. She roared. They didn't flinch. She thought it over. She roared again. Corbell stood poised, confident, happy.

The female departed. Twice she looked back, thought it over, and kept going.

Corbell walked now with a silly smile plastered across his face. He couldn't help it. Every time he let his face relax it came back. Any normal pair of men would have been bragging unmercifully; but

Gording clearly considered the incident closed. He didn't even show relief at Corbell's competence . . . which was flattering, in a way.

Finally Corbell said, "Real lions would have torn us up. Why are there so many small versions of big animals?"

"Are there?"

"Yeah. Lions, elephants, buffalo. There must have been about ten thousand Jupiter years of famine here, before the soil turned fertile. The big animals must have starved faster. Or maybe they died of heat prostration: too much volume, not enough surface."

"I believe you. I look at you and I see a different kind of dikt. We've had time to adapt to reddened sunlight and long days and long nights. Animals and plants and dikta . . . and Boys adapted through the dikta. If Uranus widens the world's path now, it will all be lost."

"I know."

"Are you ready to face Mirelly-Lyra?"

"Yeah." Corbell shivered, though the morning was not especially cool. It would get cooler. Corbell tried to visualize six years of night . . . and saw Mirelly-Lyra stalking him in the dark. "When we see her, maybe we can offer her dikta immortality. She'd do damn near anything for that."

"If we find it, my turn comes first."

Corbell laughed. "There's bound to be enough. Otherwise it would have been . . . guarded."

"Why did you pause?"

"Guarded. The hospital vault in Sarash-Zillish wasn't guarded. Were the Boys that sure a dikt couldn't get to it? It looked just like the other vault except for the guard systems, the vault door and the one-way *prilatsil* and the armored glass cubicles in the roof."

"What of it? What if one dikt or three found dikta immortality? The guarded chamber in Four City was protected from dikta by dikta who owned it. Or so you assumed."

"Uh uh. Four City was old, but not like Parhalding. More like Sarash-Zillish. I think the Boys built Four City."

The trees were closer now. Fruit trees. Corbell was hungry. He shrugged that off. He had the tail end of *something*. . . .

Ashes of a dying fire. Most of it comes out in the feces and urine . . . but not all of that; urea can build up in the joints and cause gout. Cholesterol can build up in the veins and arteries. But even when all these are washed away . . . there are still the inert molecules that accumulate in the cell itself.

Picture the miracle that can remove those. Now tell me what it looks like.

"There was nothing to guard!"

"I don't under—"

"There was nothing to guard in Sarash-Zillish. I had it turned around. Heee*yaa!* I've got it! *Dikta immortality*!"

Gording backed away a bit. "You had it once before. What fierce beast is to bite me this time?"

"I don't have to say. I made a fool of myself once. Not this time. Come on." The trees were close and Corbell was hungry.

IV

Corbell walked alone through the streets of Sarash-Zillish. His face itched. His scalp itched. His chest itched. He was trying to ignore an acid stomach.

How did loners walk? He'd seen only one loner close enough to tell. That one had been certain of welcome; his walk had been springy and confident, Boyish. Corbell tried to keep his walk springy and confident.

The windows of Sarash-Zillish were dark. The streets were empty and silent. This whole charade could turn out to be unnecessary, itches and all . . .

They had filled their bellies with fruit in the forest outside Sarash-Zillish. There Corbell had used the head of the broken spear to shave his face and his chest and four inches of his scalp around a topknot. Gording had cut away his long white hair. Gording had shaved too, for all the good that would do; there where white-haired albino Boys, but they didn't move like their joints hurt.

Laughing, joking Boys spilled out of a probable department store. Corbell turned a corner to avoid them, just like a loner would, maybe. At a distance he should pass as a loner. Close up, no chance. Dikta immortality be damned, he was no twelve-year-old. He wished Gording were beside him; but that *would* have torn it. Two was just the wrong number to pass.

The brush clogging the street thickened. Corbell waded into it. Here were tangled vines rising to a wall, roughly straight. Corbell turned along its length.

The wall, he found, had a gentle curve to it. Probably it formed a circle or an ellipse. Here there was a break, and near the break the shrubbery thickened and grew taller, as if the Park spilled out through the opening. Corbell passed it and kept going. There were park sounds: tree limbs rustling in the breeze, small birds whistling, a sudden loud squawk followed by (Corbell jumped) a burst of laughter. Boys! Boys on the other side of the wall. And the wall opened ahead of him.

Beyond the opening, a twelve foot Christmas ornament floated above knee-deep vines.

Corbell thought it through. Then, within sight of the car, he began searching for a straight sapling. Most of the bushes were of the wrong kind, but he found one that would do, even if it was a bit short. He hacked at the base with the truncated spear until he could break it loose. He sat down cross-legged—

What was keeping Gording?

Gording was well behind him, tracking him. If anyone noticed, two loners happened to be moving in the same direction, their target a reasonable one: the park.

Squatting cross-legged, Gording disengaged the spearhead from the broken haft and used it to shave the sapling. He barely glanced up as Boys came wading through the tangle in what had been a park gate: two, five, ten Boys with a giant turkey carcass slung on poles. Where were they going with that? A kitchen in a nearby building? Ef-

fete, that was. He heard a louder voice followed by a pause, and, judging that he had been hailed, he glanced up, held a grinning Boy's eye for a moment, then deliberately went back to his work. Couldn't they see he was alone? A loner would damn well make the first overtures, as and when he felt like it, *maybe*.

The new haft was shaping nicely. He tried the end against the spearhead. A bit too big. He'd shave it down a little and carve a notch and wedge it in. The rustling of the Boys diminished, moving across the street, but two quiet, puzzled voices were speaking too near him. He glanced up under lowered brows.

They were near, and looking at him as they talked. The car was—*Gording was crouched behind the car!*

How had he gotten there? Corbell hadn't heard a sound. He must have spotted the car, gone over the wall, circled inside the Park and gone over the wall again. Now he crouched, immobile, but looking guilty as hell if anyone should see him.

The tall Boy with hair like a black puffball hailed Corbell again. "Perfunctory apologies because we interrupt. May we examine your work?"

Corbell unfolded his legs and slowly stood up and sprinted for the car.

The door was open as he had left it. By that much did the Boys fail to intercept him. Gording was ahead of him, sliding in the other door. Corbell slammed his door and clung to the handle, leaning back to hold it shut, while Gording jabbed at the keyboard.

The black-haired Boy ran alongside, pulling at the door, for longer than Corbell would have believed possible. Finally he dropped away.

"You said four of anything," said Gording. "I pushed that." Crossed commas.

"I don't know where that takes us. Let's see if we can change it." He jabbed four times at the crooked *pi*. "I don't even know if there *is* a subway terminal here. There's no giant cube. Everywhere else it was a giant cube."

"Rest. If we don't find the subway we still have a *tchiple*. Dial at random."

"I lost my spear."

"I still have the thread."

"That's not what I meant. I thought I was repairing it *right*. But the way those Boys acted—Skip it."

On their crooked run through the city they saw only one other Boy. On the wreck of a skyscraper near the city's center, a lean and ragged loner was mountain-climbing three stories up. As the *tchiple* zipped beneath him his sunken eyes locked on Corbell's and held them until the *tchiple* turned a corner.

With the big dark still an Olde Earth year away, one loner and the two bands near the park might well be the total population of Sarash-Zillish. It would be nice to think so . . . but stupid. Sarash-Zillish was too important not to be on that pattern of close-spaced "phone booths". Corbell said, "Some of Krayhayft's Tribe probably got here ahead of us."

"They won't know where we're going, will they?"

"They don't know *why* we want to get to Cape Horn. I'd hate to underestimate them."

The car slowed and settled, bending shrubbery, and stopped. They got out. Gording asked, "Where are we?"

The sparse greenery in the street thickened to jungle as it climbed the slope to their right. Corbell sprang to the rounded top of the *tchiple*. The patch of citrus jungle was unnaturally flat and rectangular. Some of the trees looked very old.

"I don't know."

"But why did the *tchiple* bring us here? Where is the subway?"

"It'd be towering over our heads. Every city I've seen, the subway building was a tremendous cube."

Gording joined him on the car. Together they surveyed the rectangle of jungle.

"But a subway is below ground," Gording said. "Why would it need to be so high?"

"I never found out what was in the upper stories. Maybe places of government, or offices for rent."

"Maybe they left it off this time."

The patch of jungle was about as wide as the great cubes in One City and Four city. Corbell said, "Could be. They put a park on it instead. Then the ice cap thawed and a lot of dead dust fell all over everything." *Where did they put the entrances, though? Escalators in the center? No, the trees grew thickest there.*

Where the ground sloped up from the street, there in mid-slope was a dip. Water pooled there, forming a small, dirty, weed-grown pond. Corbell expressed himself under his breath.

"I don't know those words," said Gording.

Corbell pointed. "Under the weeds and the water and the scum and the mud, that's where we'll find steps leading down to the doors. After we dig it out. After we find shovels and dig all that stuff out of there. *Then* we get to find out if anything still works under all that."

"No."

"No?"

"They won't let us."

The sharp-faced loner was trotting toward them from across the wide street. He carried an oddly curved broad-bladed sword. Well behind him, other Boys spilled out of a building.

"Do you think you can take him with your rocks?"

"No," said Gording. "He's ready. He knows we're dangerous. He'll catch the thread on his blade."

"Into the car, then." They clambered down and in. In frustration Corbell demanded, "How did they get here so *fast*?"

"Not by car. Are there *prilatsil* in Sarash-Zillish?"

"Oh, sure, that's how they did it."

"Can we use *prilatsil*?"

"Yeah. Yeah! We won't have to dig! Assuming the damn things still work. The subway hasn't been maintained."

The loner was very close now. Corbell dialed a number he remembered: *two commas crossed, S reversed, hourglass on its side,*

crooked Pi. The car sped smoothly away. Eleven Boys watched it go.

"They tracked us somehow. They'll track us again," Corbell said. "We'll have some time, but not much."

* * *

From outside it was a copy of the office building in which Mirelly-Lyra had returned Corbell's pressure suit. In this version the elevators worked. Still following the pattern, Corbell tried the third floor.

It held. Lines of office doors, all closed.

"My name coin doesn't open them," Gording reported.

They kicked at a door. It was solid.

Gording asked, "Are there *prilat-sil* not locked behind doors?"

"Yeah. On the roof. The Boys could be there by now."

"Did you at least keep the spear blade?"

Corbell handed it over. Then it occurred to him that there might be indicators for the elevators. He slipped back into the elevator and punched all the buttons. If it stopped on every floor they'd have to check them all. He got out on the fourth floor. As he tiptoed down he heard a pattering above him like a swarm of rats.

Gording had disengaged the thread from the rocks. He had tied one end to the blade and the other to his loincloth. Now he chopped with the blade at the cloud-rug where it ran beneath an office door. "Guard the stairs," he said.

"With what?"

Gording didn't answer, didn't even look up.

Corbell stood barehanded at the stairwell door. The first Boy through would kill him. He knew it. Maybe Gording would get away.

What was Gording doing?

Gording was pushing the blade under the door with his fingers.

He pulled upward on the ends of the loincloth. He heaved. Sounds forced their way between his teeth.

Now he pulled sideways toward the door jamb.

Now he kicked at the door. It shuddered. Another kick sent it crashing inward. The blade was stronger than the door; the thread had cut the metal around the lock.

Through the office window Corbell glimpsed two Boys working under the *tchiple's* motor hatch. Then he crowded into the "phone booth" with Gording. When he shut the door there was no light. He opened the door a crack, found the crooked *pi* and kept his finger on it as he closed the door. He pushed it four times.

Nothing obvious happened.

He opened the door and slipped out into a blackness like the inside of a stomach. "Figures," he whispered. "We'll have to bet that this is really a subway. Stay here. I'll find the stairs and call you."

"Good," said Gording. Corbell slipped away.

He moved with his hand lightly brushing the wall. Once he found a cloud-rug couch by stumbling over it. He clutched at the stuff to stop his fall, and a sheet of cloud-rug ripped away in his hand. Rotted.

A sound behind him. He said, "What was that?"

Gording didn't answer.

Corbell kept moving. He could

feel Mirelly-Lyra in the dark. He kept expecting the stairs, but the wall went on and on. He circled another couch and kept going. There was no sound in this place. Cloud-rug cushioned his feet and blotted up the sound of his breathing.

Stairs!

"Here," he said, not in a whisper.

"Good," Gording said from a foot away. Corbell jumped like a man electrocuted. "A Boy stalked you until I killed him with thread. I think it must have been the loner, from his smell."

"This place may be dead. If the stairs—ah." The stairs moved beneath him. Disoriented, off balance, he sat down to let the stairs carry him down into the darkness.

The stairs stopped. Gording said, "What next?"

"Follow the sound of my voice. I know where the cars are; all the way in the back." He walked with his hands in front of him. How was he going to find the right car?

He felt his way around cloud-rug couches.

He brushed a solid wall. *Off course.* He couldn't hear Gording . . . or anything else. Were there Boys in the dark, stalking him as Gording stalked them? Was Gording already dead? Corbell was moving too fast, stumbling. Only the very oldest Boys would know the layout of this place; but they wouldn't need to. They'd follow him by his breathing.

He had found the doors.

"Gording!"

Light flashed for an instant at the far end. *Where had that come from?* Gording called, "All right."

Corbell waited in the dark and the quiet. Presently Gording spoke next to him—"Here."—felt for Corbell's hand and put something heavy in it. "I robbed the loner. Take his sword. I took his fire starter too. Where is the picture of the world?"

"Along—" Corbell guided Gording's hand. "—that wall."

The flashlight beam revealed two polar projections with the ice caps still showing. There were no glowing lights or numbers to mark the routes.

Gording asked, "Which is our door?"

"I don't know."

"The Boys have our *tchiple*. We can't surrender because we've killed the loner. The Boys may have a way to shut down the *prilatsil*. Do *something*, Corbell."

"All right. Give me the name coin." He took it, inserted it in the ticket window. Nothing happened.

He tried the next door. Nothing. He was beginning to panic. But the *stairs* had worked—

The third door let them through. The transparent door to the subway car let Gording through, closed after him, and wouldn't open until Corbell had pulled the disk out and reinserted it. They sat down opposite each other.

"Now we sit here for awhile."

"All right."

"I don't know how you can be so calm."

"I risk less than you do. Half a *Jupiter year*—" He had borrowed Corbell's phrase—"and I'll be dead. Against this I balance dikta immortality and freedom from the

Boy rule. Unless . . . Corbell, can we find dikta immortality where we're going? Or will we have to make constant raids on Antarctica?"

"I know it's in Four City. Maybe it's in other places too."

"The risk is good. Shall we sleep?"

Corbell's laugh was shaky. "Good luck."

V

Gording woke when the door went up. The car slid into the vacuum tunnel; curved downward; straightened out; rolled right; rolled left. So far so good.

Gording, watching his face, relaxed. "I did not want to ask. Where are we going?"

"It doesn't matter. Anywhere there's a . . . picture of the world that lights up. That'll tell us how to get to Four City."

"A good decision," said Gording, and he went back to sleep.

Maybe he was faking.

But his breathing was very gentle and regular.

Corbell stretched out. He wedged his ankles under a chair arm. There was no sound but Gording's breathing.

Corbell dozed. He twitched and jerked in his sleep: *running, running* . . . When the car turned upward he came half-awake, then dropped off again. But he felt it when the car slowed, and, groggy as he was, he remembered that first ride. He put his hands over his ears, turned to see Gording copy him.

The car stopped.

Doors popped open automatically. Air puffed across them, hot and wet, like boiling maple syrup in the throat. Corbell cried, "Come on!" and went through.

The great hall was a ruin. Six or seven stories of the great cube had fallen in, leaving a cross section of whatever was up there; Corbell didn't care. He kept his breathing shallow. The scalding air was thick with a taste and smell half chemical, half mildew. Sweat sprang out in droplets all over his body.

The wall map was cracked across, and dark.

He tried his credit lens in three doors before he found one that worked. Gording pulled at his arm and spoke like a man holding his breath. "Wait! Where does this go?"

"Come *on*."

They entered the subway car. It didn't help. You can die locked in a steam room, Corbell thought. He stretched out on the row of seats. "Mirelly-Lyra rigged the subway system to take anyone from the hot part of the world straight to her. We can hope she didn't skip this terminal. Lie still and don't try to exercise. Breath shallow."

He lay on his back and waited. The sweat tickled as it ran down his ribs, but he didn't wipe at it.

Something ticked on. Air blew across him, too warm, and then cooling. Corbell sighed. "It sensed the CO_2," he told himself. The air grew cool, cool.

A long time later Gording said, "I left the fire starter."

"Damn."

Silence, then, until the door went up.

There were the usual surges, then the ride straightened out. Corbell

tried to sleep again, but something was holding him back. He didn't know what it was until Gording said, "My ears hurt."

That was it. "The car leaks," said Corbell. "Just a chance we had to take. Let's hope we've got enough air to get to the end."

"It hurts. Can I do anything?"

Hey, Gording had never been in an airplane! Corbell said, "Work your jaws." He demonstrated. His ears popped.

* * *

The car slowed, slowed. It had come sooner than Corbell had expected; but they were both panting, and Gording was uneasy. Corbell felt guilty satisfaction. It took a *lot* of unknown danger to disturb Gording.

He covered his ears with his hands and opened his jaws wide, and waited for Gording to do the same. His skin was clammy. He was unbearably tense.

The doors popped open. The air that slapped across them was only warm. Through the door he saw lights dim at the back, cloud-rug humping into couches. He reached for the loner's broad-bladed scimitar.

Motion flickered in the gate. Corbell's brain flashed: *Mirelly-Lyra! Too soon!* He pulled the car door shut as *something* darted through the gate. He had what she wanted—they could negotiate—

It was Krayhayft! The grey-haired Boy stopped short. He looked at them through the glass.

He raised the fire starter.

Gording threw himself back toward the inadequate protection of the toilet. Corbell sensed it; but he himself was frozen.

Krayhayft fired past him. Light blazed behind Corbell, and he smelled chemical smoke as part of the couch burned. Krayhayft shouted, "Come out. Or I'll burn off your feet."

Corbell's hand was still on the door. But . . . "I can't do it. You'd chop down the Tree of Life."

For an instant Krayhayft was puzzled. Then, "That's not what we want. We only want to know where it is. Corbell, suppose a disaster wiped out most of the dikta, and the only survivors were half a dozen old ones? We could keep them young and breeding."

"Meanwhile they never get a smell of it."

Flame burst from the rug beside Corbell's right foot. Krayhayft said, "We need your pressure suit helmet too. Speaking of disasters—" and Krayhayft's face changed.

Corbell had never seen that look on any Boy. It frightened him. Guilt and remorse and fear. Krayhayft moaned, the sound faint through the glass. His eyes darted left and right, seeking . . . escape?

He found it. Brighter than human, he found it at once, and used it. Krayhayft raised the fire starter to his head and fired. Flame burst from that side of his head, then from the other. Krayhayft fell, and kicked spasmodically, and lay still.

Corbell spared himself one flicking glance back. Gording was still hidden, crouched behind the toilet door.

Then Mirelly-Lyra Zeelashisthar stepped through the gate. Shapeless robe, white touched with irrides-

cence, and a withered face within: the bright eyes fixed on him, and then the cane.

"Mirelly-Lyra! It's me!"

The shock almost killed her. He thought, he hoped she would faint. She recovered; she gestured peremptorily with the cane. *Come out!*

He reached for the scimitar. She gave him just a touch of what had killed Krayhayft. Moaning, he came through.

She spoke gibberish. An old man's voice translated: "You found it. Where is it?"

"Give me the cane and I'll tell you."

Her answer was a wave of guilt and mental agony. Corbell waded through it, hands outstretched for her throat. She backed away. Corbell moaned and came on. Suddenly she turned something on the cane's handle.

Sleep dragged him down toward the cloud-rug. Sleep and red rage warred in him. He was on his knees, but he waded toward her, two steps, three . . .

Musty smell.

Soft stuff cradling his cheek.

Mirelly-Lyra was in one of the shapeless couches.

Corbell got his arms under him and lifted himself out of the cloud-rug. He pulled himself toward her. She tried to cringe back without moving. Terrified.

"I caught her from behind," said Gording. He was seated facing her, holding the silver cane.

The old woman spoke rapidly. An old man's voice translated, "You don't dare kill me. I have something you want."

Corbell got to his feet with some effort. "The pressure suit helmet," he said. "Give it to me or I'll let you live . . . as you are."

Her mouth compressed. "Immortality first."

"How many settings are there on that cane?"

"Five. Two that kill. Others might kill *me*. Can you find the helmet then?"

"Probably." Corbell smiled; he saw by her face that he was right. "But so what? I'll make you young. *Then* I'll kill you if I don't get what I want." He changed to Boyish. "Hold the cane ready. But I think she won't try to escape now. We're going to get dikta immortality."

Gording looked dubious.

* * *

Corbell wasn't about to trust the Norn in a "phone booth". They wedged themselves into a *tchiple* with Mirelly-Lyra between, for a cramped ride through Four City. As the car swerved and darted through glass and concrete rubble, Corbell wondered. Should he have forced the helmet from her first?

Yes. But he couldn't wait that long. He had to *know*.

They unfolded themselves out of the car. Gording said, "I might have known it would be a hospital."

"Did your hospital have a . . . guarded place on the third floor?"

"No."

Mirelly-Lyra was looking up at the glass-mosaic face. "But I searched this place!"

"You were desperate, too," Corbell said smugly. "You just weren't desperate in the right way." He led the way up the stairs. Dust puffed beneath their feet. At the third floor he found two sets of footprints to remind him of his panic flight through these halls. He glanced back; but Mirelly-Lyra seemed docile enough, and Gording was behind her with the cane.

He turned into the hallway . . . and was lost. "Mirelly-Lyra, where are the 'phone booths'?"

They found the line of *prilatsil.* A moment to orient himself: there was the corner where he'd been hiding when the Norn came to hunt him down. He led off . . . and here was the vault door, open.

Gording said, "They guarded their immortality well."

"Wouldn't you?" Corbell pointed to the skeletons and the hole smashed high up in the wall. "But not well enough. We're lucky they didn't use it and then wreck it. Maybe they thought they'd be back in fifty years."

Gording looked around at the guard emplacements, the empty shelves, the computer console, the pair of "phone booths." "Where is it, if they didn't destroy it? Not through the *prilatsil,* unless the destination was equally well guarded."

"Through the *prilatsil.* Give me the cane first."

Would Gording balk? He didn't; he handed Corbell the weapon, then stepped forward to study the pair of glass booths. Only one had a door. He stepped inside.

Mirelly-Lyra snarled something. The box translated: "Are you mocking me?"

Corbell waved the cane under her nose. "Suppose I am?"

She came at him with her fingernails. He didn't bother with the trigger. He rapped her on the head with the cane, twice, before she backed out of range.

Gording had found the button on the post. He pushed it.

Corbell shouted, "Hee*yaa*!" The other booth danced with drifting dust motes.

Gording opened the door and said, "Nothing happened."

"Not quite true," said Corbell. To Mirelly-Lyra he said, "You don't have to if you don't want to. You can trust me or not. *Gloat, gloat,* he mocked himself, and was a little ashamed. But he'd fought for this!

She swallowed whatever words were on her tongue. She was truly desperate. As she entered the booth Corbell caught Gording's eye and pointed to the booth with no door.

The dust floating in the booth suddenly thickened. Gording smiled and said, "Ah."

The Norn had caught it too, but she didn't understand. . .and Corbell was bubbling with it. "Inert molecules from your cells! Chemical medicines won't reach that stuff, but the 'phone booth' does. It takes just those dead molecules and does the instant-elsewhere trick with them. Just the stuff that builds up over ninety years of life. See it now?"

"I don't feel any different," she said uncertainly.

"You should. I did. It was like I'd caught my second wind. Of

course I was moving at a dead run. It's nothing obvious. What did you expect? In a couple of days you'll find dark roots in your hair."

"Red," she said. "Fiery red."

"Where's the helmet?"

She smiled. She still looked like an old woman, but was there something malicious in that smile?

PEERSSA FOR THE STATE

I

Corbell's pressure suit sat limp in a guest chair in Mirelly-Lyra's office. Gording and Mirelly-Lyra watched him detach the helmet and set it on his head. He cleared his throat and said, "This is Corbell for himself calling Peerssa for the State. Come in, Peerssa."

Nothing, nothing, nothing . . . "He's got to be in range by now. Peerssa, dammit, answer!"

Gording pushed the suit aside and took the chair. The silver cane remained fixed on the old woman. She didn't notice. Malice and victory! She gave Corbell the shivers.

Nothing, nothing, nothing, n—The voice came faintly, fading in spots. "Peerssa for the State, Peerssa for the State calling Jaybee Corbell. Please allow for a delay of sixty-seven seconds in transmission. Corbell, I have a great deal to tell you."

"*Yeah*, you do! I've got a great deal to tell you too! I can tell you most of the history of the solar system. Tell me first, have you taken control of the planet Uranus? If so, what do you plan to do with it?" To Gording he said, "I'm asking him now. We'll know in a minute."

"What takes so long?"

"Speed of light. Uranus must be thirty-three and a half light-seconds away."

Gording nodded. He was not impatient. Even his handling of the cane seemed negligent . . . but it never left the old woman. Good. Because she still had that *look*.

When Peerssa spoke he was irritatingly placid. "Yes, I am guiding a planet I believe to be Uranus. You were right in guessing that this is the solar system. After losing contact with you I flew to investigate the most easily available anomoly, the new planet between Jupiter and Saturn. I found a satellite with control systems which would respond to—"

"I know all about the motor! The question—" He bit it off. The delay was going to drive him nuts. Peerssa was still talking:

"—my broadcasts. I was able to probe the fail-safe programs first. Otherwise I might have damaged something. Eventually I found an object in the planet's upper atmosphere radiating strongly in the infrared. I found a tremendous motor, a fusion pulse drive clearly intended to move the entire planet. Oh, you know about the motor. All right. I've already started the braking sequence. In twenty-two days Uranus will be inserted into orbit two million miles ahead of the earth. I'm going to move the Earth further from Jupiter. We'll cool it down to normal."

"Don't do it!" Corbell barked. He remembered uneasily that he had never been sure of Peerssa's mo-

tives. "Listen, life on Earth has been adjusting to this situation for a million years or more. If you screw it up now most of the biosphere will die, including what passes for humanity these days."

The old woman already looked younger, if only in a tightening of muscles in her face, a smoothing of the pouchy look. Corbell looked away from the malicious cat-smile. He lifted the helmet and said in Boyish, "We were right. No coincidence at all. Peerssa dropped me here, then went to look Uranus over. He's going to put everything back the way it was when he left Earth."

Gording stared. "But the ice! The ice would cover—"

"Bear with me a little longer, will you?" He lowered the helmet on Gording's answer.

Peerssa's delayed reply came. "I do not take your orders, Corbell. I take orders from Mirelly-Lyra Zeelathisthar, who was once a citizen of the State."

He should have known better, but it took him by surprise. He screamed, "You traitor!"

Mirelly-Lyra threw back her head and laughed.

Corbell laid the helmet on the desk. It took him a moment to find his voice. "No wonder you were smirking. What happened?"

She was thoroughly enjoying herself. "I tried to call your autopilot. No luck. A few days ago I tried again. It may have helped that my translator uses your voice. Peerssa and I talked for many hours about the State, and the world, and you—"

She broke off because Peerssa's reply had arrived. "My loyalty has never wavered, Corbell. Was there ever a time when you could say the same?"

"Drop dead," Corbell told the helmet. "Stand by. Mirelly-Lyra is with us now. We'll try to talk her into changing your orders." To Gording he said, "She rules my autopilot. She rules Uranus. I'm tired."

"You must persuade her not to let it carry out its mission. This is urgent, Corbell."

"I thought of that." Corbell closed his eyes and leaned back.

He could watch it happen. As long as he could survive at all, he would be young. He could watch glaciers cover Antarctica until the ice was a mile thick. He and Mirelly-Lyra could watch the dwarf buffalo and the nude polar bears and the Boys and the dikta flee north until they froze in snowstorms or starved in land baked bare of life or died for lack of the vitamin D in kathope seed.

Maybe that was an angle. Did the old retread want the Earth all for herself? Or would she prefer company? But she'd fled the Boys once, and lived alone . . . hmm. Where did she get her food? Was there anything she couldn't *stand* to see extinct?

He opened his eyes. Gording was looking concerned for him. Oddly, so was the old woman.

"Nothing hurts," Gording said. "I was used to things hurting. Sometimes my breath would come short. Always my joints and tendons and muscles ached. Corbell, you've found it. We're young again. You did what I could not."

"Yeah. Good."

"Play on her gratitude. I can't talk to her. It has to be you. You're capable. The fate of the world is on your shoulders."

"That's all I need." He closed his eyes for a moment . . . just for a moment . . . and then he asked Mirelly-Lyra, "How do you feel?"

"I feel good. I feel strong. Maybe I only want to believe your lie."

"Okay. Pay attention." Corbell set the helmet between them. He talked half for Peerssa's benefit. "The world is baked and dead everywhere except in Antarctica. What's left alive is all tropical stuff evolved for six years of daylight and six years of night. If Antarctica gets covered by ice again everything will die. The ruling population is—" He used the Boyish word. "Boys, eleven-year-olds who live forever. There's a minor population of adults for breeding. The men look like Gording, or younger. They're human. There are some minor changes—" He began to describe them.

Mirelly-Lyra regarded Gording without favor. But she *must* see him as human. The biggest difference, the receding hairline, looked natural on an old man.

He hadn't impressed her yet. He went on: "If we ever expect to get a State established again, it'll be with the adults, the dikta. The Boys are too different. What I'm getting at is, there *is* a chance. Right now there are about ten women to every man, but in a hundred years it'll be nearly one-to-one." An angle there? He definitely had her attention. "Of course, your role wouldn't be very important at first, with that big an imbalance. But you'd be the only woman with a full head of hair. And the only redhead."

"Just a minute, Corbell. Isn't it true that the Boys rule the adults? I don't want to be a slave. And what about the Girls?"

"The Girls are long dead."

"Ahh." Mirelly-Lyra must have hated the Girls.

"Right. It's Boys and dikta now. We can get the dikta to move *here*, because we've got the dikta immortality. They'll come. I know where to find a ship."

She was shaking her head, frowning. Now Corbell knew that she'd bought half of what he was selling. Against half-bald women her great beauty would rule the men who ruled the dikta! But—"How long have the Boys ruled?"

"Ever since you brought the dikta to Antarctica as escaped convicts, whenever the hell that was. Say a million years."

Oncoming youth put music in her laugh. "And now they will break free, that suddenly? The sheep will become wolves because we offer them a sufficient bribe?"

Dammit, she did have a point. He changed languages. "Gording? Will the dikta revolt?"

"Yes."

"They never did before."

"The dangers were too great. The rewards were too small."

Maybe. Corbell switched to English. "He says they will. I believe him. Now *just* a minute, let me tell you why. First, they have *not* been bred for docility. They've been bred to produce a better strain of Boys, and they've got the genes.

Second—how do I put this? You know what a cringing man looks like?"

She grinned. She'd seen Corbell cringe, damn her.

"Okay. They cringe. But it's a gesture, a formality. The next second they're walking as tall as ever. The Boys cringe to each other, too. I think the dikta haven't revolted for a million years because the odds weren't right. Now they are."

She sat silent, frowning.

"What did you think you'd get out of Peerssa moving the Earth?"

"I thought . . . We're the last of the State, Corbell. I thought we could start the human race over."

"Adam and Eve, with Eve in charge. Mirelly-Lyra, we'd better hope we can mate with the dikta, because, frankly, I'm terrified of you. I don't think I could get it up."

"Low sex urge?"

"Yeah. Would you like to rule the dikta instead? You'll have one thing going for you. You rule the sky. Once again a Girl rules the sky."

He saw the beginnings of a smile *(Corbell forgets that I can rule men with my beauty alone!)* and he pushed it home. "But you've got to give Peerssa his orders now. He's already started the braking sequence. Move the Earth now and it's the end of the world."

She leered teasingly. "I should make you wait."

"Peerssa has already started the—"

"Give me the helmet."

"God damn braking sequence. Here. Wait a minute." He didn't let go of the helmet.

"Corbell? Isn't this what you wanted?"

"I just had the damndest thought." *Don't blow this. The fate of the world—Shaddup.* "Peerssa, a point of information. Would it be possible for you to—"

II

From the roof of the office building they watched Uranus pass.

The planet must be smaller than it had been at Corbell's birth. Its drive was not all that efficient; it must have blown away megamegatons of atmosphere during aeons of maneuvering. For all that, a gas giant planet was now passing two million miles from the Earth.

It was tremendous. It glowed half full near the horizon: a white half-disk touched with pink, banded and roiled with storms, and a night side black against the stars. From the black edge a tiny, intense violet-white flame suddenly reached out and out, lighting the night side, expanding, reddening, dissipating.

Mirelly-Lyra said something that was pure music. No wonder she had been able to persuade men to do her bidding. (The old man's voice said, "Glorious.") Her white robe was a shapeless pale shadow in the dark. Corbell stood a little apart from her. Now that she was no longer an old woman, he was more afraid of her than ever. In very truth, the Norn now ruled the fate of the world.

Corbell was very twitchy tonight.

He called into the helmet in his hands. "Peerssa, how goes it?" And waited for the response. Nothing, nothing—

"Green bird." The autopilot was indecently calm. "It was difficult to plot a new path that would not intersect a moon, but I did it. Earth's new orbit will be somewhat eccentric. Her average temperature will vary around ten degrees lower."

"Good enough." He set the helmet down. His urge was to call every two minutes. A giant planet falling that close wasn't glorious, it was *terrifying*.

She said it again. "Glorious. To think that the State once reached such heights! And now there are only savages."

"We'll be back," he said, and laughed too loudly. "Gording doesn't know it, but what he's doing in Dikta City is forming the basis for a population explosion. In three thousand years we'll be building interstellar spaceships again. We'll need them. Earth will be too crowded."

"I hadn't thought of that. Perhaps Gording did. Do you really think the dikta will come? A million years of slavery, after all—"

"They'll have to come." He'd thought it out in all its intricate detail. "In a few months Cape Horn and Four City will be in the Temperate Zone. Plants that grow well in Antarctica will grow well here once we transport them.

In Antarctica it'll be colder than the Boys expect. They'll huddle in Sarash-Zillish through six Olde Earth years of darkness. Meanwhile the dikta will be setting themselves up here."

"All very well if the Boys wait. You've said they're very intelligent. They may attack immediately."

"Let them wait a few *months* and we'll give them a nasty shock! We'll have Peerssa in orbit then. Didn't he tell you? He's got a thing that can blast them from orbit while they try to cross the ocean. They'll think it's the Girls. They'll try to wipe out the Himalaya valleys and the Sea of Okhotsk. But if they wait long enough . . . There's going to be rain, a *lot* of rain, when the Earth cools off. It'll probably swallow Dikta City. The Boys'll think the dikta drowned."

Uranus jetted violet-white flame. Peerssa's path through Jupiter's moons was a complicated one. The night was vivid with lights: Jupiter, Uranus, the expanding pinpoint flare of the world-moving drive, the moons. The air was hot and humid and redolent with some rare scent, not quite musk, not quite flower shop. Corbell wondered where it came from. Were whales holding a mating season offshore? The air went to his head.

The shadow in the dark asked, "Will the dikta men find me beautiful?"

"Yes. If the women liked me, the men will like you. Beautiful and exotic."

She turned to him. "But you don't find me beautiful."

"My sex urge is supposed to—"

"That is no answer!" she flared. "You lay with the dikta women!"

He flinched back. "If you must know, I've always been a little afraid of a beautiful girl. And I'm scared stiff of you. My hindbrain thinks you're still carrying that cane."

"Corbell, you are well aware that the dikta may not survive the



change in their biological rhythms. The sun shows every day of the year in Four City." She touched his arm. "Even if they live, we are the last human beings. If we die without children . . ."

He wanted to shrink away, but something in him simultaneously wanted to move closer. He suppressed both urges. "You're moving too fast. There may be dikta women carrying my children. *That'll* tell us if they're human—and even if they aren't, they're close enough."

"Let's go inside. The heat—" When he gestured toward the garish intruder in the sky, she tugged at his arm. "If it falls on the Earth, do you really want to be watching?"

"Yes." But he picked up the helmet and followed her. She didn't have the cane any more. All she had to wave at him was a planet ten times the size of the Earth.

It was cooler in the elevator. Air conditioning. His nerves still tingled, whether from Uranus's passing or from the nearness of the Norn . . . He sniffed suddenly, and had to swallow a laugh. *That* was what he had smelled on the roof. She had never won perfume before.

Her hood was thrown back. Her hair was exotic: long, fine white hair flowing out of a fiery red undercoat. Of the wrinkles of age there were only traces left. Her breasts were . . . exotic, yeah: high and conical, delightfully pointed under the robe. Would the dikta see them as powerfully sensual? or as evidence of animal origin?

The elevator had stopped. The doors opened. But Corbell was flattened against the wall, and Mirelly-Lyra wasn't moving either. She watched him uneasily as he took in great lungfuls of air, using all of his strength to hold himself still.

He wanted her. It was a madness in him, and he was terrified. "Perfume," he said, and his voice was a croak.

She said, "Yes. Shame on you for forcing me to such means. If it gives you pleasure to attack my pride, you've won."

"I don't under*stand*!"

"Pheromones. I altered my medical system to make pheronomes to affect your sex urge. Pheromones are biochemical cues." She stepped forward, put her hands on his shoulders. "Do you think I wanted it this—"

And the touch of her was all it took.

The fastenings on her robe weren't closed, save one, which ripped. He had more trouble with his own loincloth, his hands were shaking so, and he howled with frustration. She had to do it for him. He took her on the floor of the elevator, quickly, violently. Maybe he hurt her. Maybe he wanted to.

And his head still bubbled with the perfume. He had not had time to notice the differences in her. Now he did. Even fifty thousand years had wrought changes. Her ankles were heavier, her body was thicker in every dimension, than the standard of beauty in 1970 AD. And she had the damndest eyes, with a tilt that was not oriental . . . and a soft woman's mouth . . . He took her again. She wasn't passive, but she wasn't wholly enjoying it either; she was

frightened of what she had unleashed.

Afterward he was calmer. They moved out of the elevator onto the cloud-rug floor. The third time it was she who mounted him. He tried to hold himself back, to let her find her own way, but when it was over he could see his handprints bone-white on her hips. He said, belatedly, "Are you all right?"

She laughed. Still straddling him, she ran her hands through her hair. "I'm young. I'll heal."

"You used an aphrodesiac on me."

"Yes. Aphrodesiac. The pheromones were Peerssa's suggestion."

"What? *Peerssa?* I'll kill him! He—and *you*! You used me like a bundle of reflexes, the pair of you!" He wanted to cry. "Not like something that thinks. It's just like that damn cane."

"Forget that damn cane! We have to have children. We're the last ones. What do you *want* from me, Corbell?"

"I don't know. Ask me when my head starts working again. I want Peerssa dead, I want Pierce the checker dead. Would he kill himself if you told him to?"

"He did what he had to. He has to make the State again. Corbell, isn't this better than the cane? Isn't it?"

"All *right*, it's better than the cane."

"Then what do you want? Will you mate with me without the pheromones? Shall I tell Peerssa to follow your orders?"

He wanted (he discovered) Mirabelle. He wanted the old ritual: dinner at a new restaurant recommended by friends, and brandy Alexanders afterward, and the king size bed. They'd bought a water bed a little before the cancer came to tear up his belly. Now here he was on his back in cloud-rug, in a corridor outside an elevator, with the strangest of strange women. "Not your fault," he said. "I want to go home."

She shook her head. "I want to go home too. We can't. We have to build our home again."

They were already doing that, Corbell thought. Maybe they'd even do it well. He said, "Even love stories aren't the same. Pheromones! Jesus, what a way to save the world. Will you please fix that translator so it talks to me in your voice?"

"All right. Tomorrow," said an old man's voice.

"And put me in control of Peerssa, if you value my sanity. I'm sick of him running my life."

"Now?"

"Tomorrow." One more thing he would have liked to do. He would have liked to destroy the cane by smashing it repeatedly into Peerssa's brain case. But they might need Peerssa *and* the cane against the Boys, if they came too soon.

So he rolled aside and looked for his loincloth . . . and then, changing his mind, he leaned close to Mirelly-Lyra and inhaled deeply. Uranus must have passed by now, and Earth was on its way into a wider orbit, and world-saving could wait until tomorrow. Maybe the pheromone perfume could be used judiciously, in much smaller quantities . . . ★

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Davy, Edgar Pangborn, Ballantine, 265 pp., $1.25

As YOU CAN SEE from the above list, I had planned to close this column with Edgar Pangborn's *Davy*. I chose that slot on the last-heard = best-remembered theory—I had intended to see to it, to the best of my ability, that Edgar sold a helluva lot of books and got a little more of the recognition he has deserved for so many years.

But before I could type the first paragraph of this column, the news came down. Now I sit here staring out my office window, watching the Bay of Fundy pet the beach with timid gentle strokes, watching bold expiorer clouds set sail for far New Brunswick, and I know I can't save Davy for last after all. You can't end with a bummer.

Edgar died on February 1, 1976, at the age of 66.

He felt that his writing career truly began with "Angel's Egg," (*Galaxy* 1951) although he had sold his first novel (a mystery, under the name "Bruce Harrison") in 1930. He won the International Fantasy Award, the same prize Sturgeon's *More Than Human* had won two years earlier, in 1955 for *A Mirror For Observers,* currently available in the Avon/Equinox "SF Rediscovery" series, and sold mysteries, historical fiction, fantasies and "hard" sf. He was a writer of enormous skill and depth, an equal of Sturgeon and a peer of Mark Twain, and I'm bitterly sorry that he died before he—and you—could read the words I wrote about him in the March '76 *Galaxy Bookshelf.* I am bitterly sorry that he died before the world noticed him, before he had attained the stature of a Twain, which he surely must some day. I am fiercely glad that, as "Harper Conan and Singer David" (*Tomorrow Today,* Unity Press—see March '76 *Bookshelf*) clearly shows, Edgar died in his prime, at the absolute top of his form as an artist. And I am totally determined to pound into your skull (if it isn't there already) the conviction that Edgar Pangborn is an important author who belongs on your *must*-read list and mine and belonged there, goddamit, twenty *years* ago.

Take *Davy.* A Hugo nominee for 1965, it lost out, for God's sake, to *The Wanderer* (about which more next month) and is billed in Ballantine's current edition as "The 'Tom Jones' of Science Fiction." I couldn't seem to get a review copy, and then a gent named Tom Pigaga from U. of Nebraska's English Department (having tried to order it for his own classes and been told it was out-of-print) sent me his personal copy in the mail, calling it "a small gift to a friend and a peace offering to the world at large." According to his letter, Tom's been using *Davy*

in class for three years, and he says he's been coming back to it once a year or so since 1964, "as both pilgrimage and labor of love."

Thank you, Tom, stranger and friend. I intend to do likewise, and I urge all of you to do the same—if you can get a copy.

Davy is the ultimate After-The-Collapse novel, the only one I've ever read that *totally* rang true (well, *Earth Abides* comes close—but Stewart achieved versimilitude through facts, with painstaking extrapolation. Pangborn does it with characterization.). I see where Ballantine got the "Tom Jones" allusion—but I think it reads more as if Mark Twain had written *Huck Finn* as an adult sf novel. It is a warm, vibrant, laughing, sprawling giant of a book. It is, as Sturgeon has called it, "a rollicking, cadenced, surprising, provocative and musical book." It evokes feelings the way a master musician elicits notes from his instrument: in chords, and breathtaking arpeggios. It has significantly changed my life and my writing, changed the way I perceive my fellow monkeys, made me happier to be alive. It is what the doctor ordered and why the preacher danced. It is good.

Am I getting through to you? Will you know what I mean if I say that Pangborn's characters are lovable? Do you understand the sense in which I use that word? Sam Loomis and Pa Rumley and Dion and poor old sin-ridden Jed; Caron and Emmia and Minna and Bonnie and Mother Spinkton and especially Nickie (whom I shall always love and lust for); these and Davy himself are people I cherish, friends I'm glad I made, and I'm deeply grateful to Edgar for introducing me to them. I wanted to meet him, to thank him for becoming a writer. A man who can evoke that much love for totally imaginary people cobbled up out of the spare parts in his subconscious is a rare and splendid thing, an asset to the human spirit.

There is no plot to Davy. A plot would overcrowd it. It has, rather, a . . . *direction* that it moves in.

Now *I* would like someone to introduce *me* to review copies of *West of the Sun, Company of Glory* (I have the Aug-Oct '74 *Galaxy* serialization, but I want the book too), *The Judgement of Eve, Good Neighbors And Other Strangers, The Atlantean Nights' Entertainments, Light Another Candle, The Trial of Callista Blake* and the host of uncollected stories and novelettes set in the post-Holocaust world of *Davy* that will surely (please God) be collected and published soon. If any enterprising fan and/or bookseller knows where I can *buy* copies of same, I'll be happy to, whether or not I do get review copies. The same goes for *Ten Tomorrows* and Terry Carr's *An Exaltation of Stars* and *Universes 1, 2, 3* and *5,* which Tom Pigaga says include recent short Pangborn.

I hope it takes me a lifetime to

assemble and get to read all that Pangborn. 'Cause that seems to be all there's gonna be.

It's plenty. Thank you, Edgar.

* * *

Most of the above data, biographical and bibliographical, come from the next subject I want to cover. I have, I tell you three times, NO SLIGHTEST INTENTION of doing fanzine reviews in this column ("... at this time," he finished tantalizingly), but *Locus* is not precisely a fanzine. It is a newspaper—the newspaper of the sf world. I once gave away, as opposed to "spent," a year editing a "specialized-audience" paper (a real-estate weekly, God forgive me), and I know what a sonofabitch of a job it is, and I know Charlie and Dena Brown do about a six-times-better job than I did on half the budget and in a more honorable cause. Their most recent (at this writing) edition (Mar. 31 '76) contains two splendid write-ups on Edgar Pangborn, one of them by Peter S. Beagle (*A Fine And Private Place, The Last Unicorn, I See By My Outfit*), that alone are more than worth the 50¢ cover price. The reportage is conspicuously and notoriously accurate (all right, everybody's human—but these guys print retractions where you can see 'em), up-to-date and as thorough as space allows; the market reports are consistently more reliable than the ones in the SFWA *Forum*; the "People Notes" are usually interesting and informative (did you know that Larry Niven is working on a sequel to *Ringworld*?); the advance publishers' schedules are enormously helpful in getting to a book during those brief few weeks when it's actually on the stands, available for sale; the annual sf book and magazine summaries are infinitely more accurate than the guesses of *Publisher's Weekly*; the "Media Notes" are appalling glances at the atrocities Hollywood is planning to perpetrate on sf (still no action on the Star Trek movie, and the *Damnation Alley* movie is going to star . . . are you ready? . . . Charlton Heston as Hell Tanner.); and the convention reports are the only *totally* comprehensive ones I know of in the field. (By the way, speaking of conventions . . . no, I'll get to that later.)

But that ain't all, folks: Charlie, Dena and their noble staff undertake to read and at least capsule-review every sf book, new or reprint, published in English, a plainly phenomenal task I wouldn't attempt for all the tea in Acupulco (890 titles last year alone!). Even the quickie-reviews, by far the most common, are thoughtful and contain all the necessary poop to locate the book should it interest you. A staggering achievement. The longer reviews are invariably thoughtful, too.

What it is, it's 8½ × 11″ printed

on good stock with incredibly small and startlingly easy-to-read type, and it comes folded twice like a flier for the Rexall One-Cent Sale, and it averages 8-12 pages an issue of which 2-4 pages may be ads (usually for things I'd want to buy/go to/apply for), and it comes out 15 times a year, monthly plus extra issues in January, April and September. Single copies 50¢, 15 for $6, 30 for $12, unless you're overseas in which case it's 15/$15 (if you want airmail, or 15/$6 if you want to wait for sea mail). (Got that?) Make checks payable to Locus Publications, P.O. Box 3938, San Francisco CA 94119. Any sf news items you would like to circulate should go to the editorial offices at 34 Ridgewood Lane, Oakland CA 94611, for which you will get a Hearty Handclasp and a good story to tell your fan friends.

I couldn't do this job without *Locus,* and I recommend it to anyone genuinely interested in the field, whether as writer, reader, fan or horrified onlooker. It's one of the best newspapers in America, in its weight-class, and it will plug you, solidly and reliably, into the sf world.

* * *

On we go to *Imperial Earth,* Arthur C. Clarke's new biggie. Arthur told the United States Congress that *I.E.* was his most ambitious novel. Unquote. The first run of 20,000 copies has sold out (in *hardback*!) as I write this in May, and the second may do so before you read it: the book, says *Locus,* has been doing phenomenally well.

Well, I'll tell ya: by me it would have made a great novelette.

Maybe even a short story. But not a book—not even a novella. There's enough story to comfortably fill a fair-size novelette, and *good* story at that. But the bulk of the book is taken up by an extended "travelogue" of Earth in the Quincentennial year 2276, which I found mostly cutesy and clever and satiric and dull and not very plausible. You know, the kind of stuff every beginning author does, future generations commenting snidely on the odd and uncouth customs of their 20th-century ancestors and like that. There were some nice touches, e.g. the political system in which only unwilling citizens can serve in public office, but most were about as likely to actually happen.

What I mean to say, it was nowhere near as actively unpleasant to read as the majority of the books that grow in my little mailbox by the Bay—I didn't have to hold my nose to get it down. Arthur's always a good, painless read, you know that. It's just that this one was like a diet-book (to continue the above metaphor): a low-calorie concoction with a guaranteed non-carcinogenous story-substitute and non-fattening characterization. A

half hour later I was hungry again. Sank my teeth into some John McPhee and gnawed off a couple of chapters, washing it down with the new David Bromberg album.

Oh, you wanna know what it's *about*? Well, this guy from Titan (a clone of a clone of the most powerful sonofabitch thereon), goes to Earth to round out his education and get himself cloned and make a speech (on account of it happens to be America's five-hundredth birthday). While he's digging the Quincentennial festivities as an honored guest, he finds out some heavy stuff about two childhood friends with whom he used to play Doctor.

There you go. Twenty thousand copies, eight bucks a hit. Fast as they can print 'em.

Oh yeah, and there's this terrific intellectual-puzzle type game called "polyominoes" which will certainly be the rage at the next Worldcon (speaking of conventions . . . no, later.), among the more compulsively brilliant fans. Me, I might get time to fiddle with it along about the time the roof gets shingled—say, next incarnation.

I don't really mean to do a hatchet job on this book. I just found it sorta frivolous, kind of charming, and the sales figures make me nervous. *Rendevous With Rama*, with not much more story to it than *Imperial Earth*, copped the Hugo off some mighty heavy books two years ago. There's some mighty heavy books up for Hugos *this* year.

* * *

Oboy. Now we come to one of the few Nebula-winners of recent vintage that I liked worth a damn: Joe Haldeman's masterful *The Forever War*.

Should there be one of you out there so removed from the currents of the sf ocean that you haven't heard of *The Forever War* yet, just take my word for it and go buy the book. If you *have* heard of it and *haven't* bought it, shoot your advisers and go remedy the omission at once. It is the whelk's kneecap, friends, the genuine dromedary's drawers, probably the ultimate space-war novel.

Some grumble at its similarities to *Starship Troopers*, the combat suits and so on. Others crow at the *differences* between Joe's kind of war and Heinlein's, calling *Forever War* a direct refutation of *Troopers* and an indictment of dat ol' fascist Heinlein. Both camps might be interested to know that at the 1975 Nebula Awards ceremony (at which Heinlein received the first Grand Master Nebula for lifetime contribution to sf), Heinlein and Haldeman were introduced, and Heinlein stuck out his hand and said, "Just read your book, *Forever War*. Terrific." At which Joe blushed and *fum-fah*ed and *hamahama*ed and spent the balance of the evening walking around a half-meter off the floor. Something there is in fandom that likes a feud, real or imaginary.

I have to agree with Heinlein: it's a Peach. Joe extrapolates relativistic temporal distortion to its logical effect on interstellar warfare: soldiers return from a battle to find Earth changed beyond recognition by different time-rates, their loved ones and friends long dead—then return to the pointless, deadly, *perplexing* war between the stars. Joe's characters are real, his observations on war are biting and trenchant, his army-of-the-future is all-too-plausible, and his pace is compelling. By God, he even pulls off a happy ending without straining.

I suggest you read *Forever War* in combination with *Starship Troopers*—most instructive. But if you are one of the knee-jerk radicals who keep coming up to me at conventions babbling about fascism (speaking of conventions . . . forget it), you want to bear in mind four things:

1) *FW* assumes that Earth's interstellar army establishment will resemble the present U.S. Army in brainlessness, venality and rapacity; *ST* assumes that they will generally be ethical men, fallible but good-hearted. Both are, on the evidence of history, conceivable—and remember that in Heinlein's M.I., generals fight too.

2) *FW*'s army is conscript; *ST*'s is volunteer—resign any time, no penalty except loss of franchise.

3) Heinlein's future society is a hypothetical experimental *alternative* to our own; Haldeman's is the straight-line extrapolation of our own.

4) Heinlein is not Juan Rico (or Col. Dubois) any more than Joe is Pvt./Major Mandella.

Onward.

* * *

To more splendor, exclusively visual this time. A pair of coffee table books have appeared in my mailbox, and they're so splendid I'm going to have to go out and make a coffee table to put them on (just *before* I shingle the roof . . .).

Who could be surprised that *The Fantastic Art of Frank Frazetta* was superb? Frank has been the undisputed master of fantasy illustration for God only knows how long, and his style is the most imitated in the field. People who've never *heard* of sf notice *The Fantastic Art* in my office, exclaim, "Oh, *him*," and bury themselves in the book for hours.

All I need tell you about *TFAOFF* is that it contains 42 color plates of Frank's most famous paintings (plus a few cartoons) with reproduction so achingly, exquisitely *perfect* that the pictures probably, as Thurber once said, "lose something in the original." The book is worth three times its cover price of $10, and I'm deeply grateful to *Galaxy*'s Assistant Editor and Official Whipping Girl, Cynthia Bolling, for passing along the review copy, which she lusted after, when she could just

as well have denied all knowledge of its whereabouts. Thanks, Cynthia.

In fact, *TFAOFF* is so damn good that I waited a couple of days after I was done with it to open up *The Best of Stephen Fabian*. Didn't seem fair to stack a newcomer's first black-and-white folio next to the best oils of an old master.

I needn't have. Fabian's first collection stands quite well beside Frazatta, thank you, in *spite* of the fact that it's all black and white. You can't flip the pages of *Galaxy* with your eyes open and fail to notice that Fabian is great: what I had somehow failed to notice was that he is *GREAT*. There are 50 plates in this spiral-bound folio, many from *Galaxy* and *IF*, some from books like *The Occult Lovecraft* and *Savage Tales of Conan* (I must admit I find Frazetta's Conan more badass), some from fanzines like *Energumen* and *Fantastic,* and some previously unpublished. All are superb, my particular favorites being #s 6, 31 and especially-49 (all three untitled), and the repro is as good as that in *TFAOFF*.

It's available, as far as I know, only by writing Loompanics Unlimited, Box 264, Mason, Michigan 48854, $12.50 a hit. Worth it, by me: with its black-and-white cover and spiral-notebook format, it's not as visually attractive a coffee-table package as the Frazetta, nor as durable an artifact. But then, it's easier to remove individual plates for framing without destroying the rest of the book. You pays your money and takes your choice.

Me, I choose both.

* * *

I've gotten a couple of fascinating letters from blind fans, both of whom commented on the cussed difficulty of obtaining sf in Braille. I'm instructing my agent to put a clause in all future contracts requiring a Braille run; I understand David Gerrold does this as a matter of course. Well, those last two books aren't a helluva lot of good to the blind, but the next few items are.

Two of them, anyway. In my continuing campaign to be the most eclectic sf reviewer in the North, I've located three phonograph records (with concomitant cassettes and tapes) of sf, and the first of these is a turkey.

2112 is a rock album, one side of which is (God save the Mark) a rock opera, whose story line no doubt seemed to its creators to be science fiction. Furthermore, side two contains a gem entitled "The Twilight Zone," which its got heavy lyrics, man, about time and space collidin' and stuff. So when my neighbor Francis lent it to me, I gave it a listen.

Well, I can't exactly criticize it *musically*. Rush, a three-man British band (I *think* they're British. They taste British.), are technically

competent and just what they want to be: a superb Led Zeppelin imitation. If you like the thing Robert Plant does with his vocal chords, and what Jimmy Page does to a guitar, you'll love Rush's music. It gave *me* a pain in the ear, forced me to medicate myself with some Loudon Wainwright III, but that's my taste, right?

About the "Science Fiction" part. "2112," the title piece, is dedicated to "the genius of Ayn Rand," and based on some extensively-quoted but nowhere identified work of hers with which I was not familiar—and which seemed, from the quotes, to be a dog. There's this Big Brother Future in 2112, see: a world ruled by the Priests of the Temple of Syrinx, whose "great computers/ fill the hallowed halls," a world where nobody ever has any fun. Then this wandering person (unnamed, called "he" for convenience) stumbles across a hidden old room behind a waterfall, in which rest the rusted remains of an electric guitar. He teaches himself how to tune it, apparently devises a portable amplifier-and-power-pack, and rushes ingenuously off to share his marvelous discovery with the Priests. To his confusion and horror, they jump up and down on the thing (if someone came into my chapel and started playing an electric guitar like Jimmy Page, I might stomp it some myself) and drive him out into the desert, where he starves to death. The three musicians who've been mysteriously following him around all day, maddened by grief, gnash their instruments with their teeth and hurl themselves through their own amplifiers.

Oh yes, there's an extended quote on the back of the jacket, pointedly not ascribed to Ayn Rand, which describes a science fictional background world utterly inconsistent with that of the rock opera. And the "Twilight Zone" cut isn't even worth making fun of.

So I'll drop the bleeding hulk and turn to: the Goodies.

Alternate World Recordings is going to end up being a tremendous boon to blind sf fans, fans with eyestrain, illiterate fans (don't laugh, don't laugh) and fans with alexia. And also to those who like both spoken-word recordings and sf.

The only two I've received for review are just great: excellent and apparently durable recordings of two splendid vocal instruments rendering good sf that is uniquely suited to the medium. The first of these is a surefire classic: Fritz Leiber reading his own Hugo-winning *Gonna Roll The Bones* and a Fafhrd & Gray Mouser fragment called "In The Witch's Tent." If you've never heard Fritz read, take my word that he has one of the great speaking voices of our age, equal even to the hype that Forry Ackerman gives it on the jacket. To tell you the honest truth, I didn't

care a hell of a lot for "Bones" when I first read it in *Dangerous Visions* years ago. But after hearing Fritz read it, I like it fine. A rip-roaring fantasy about an ace crap-shooter who meets . . .

There's also a lyrical and concise appraisal by Poul Anderson of Fritz and his work on the dust-jacket, and a rather good cover drawing by Tom Barber.

The second record comprises two poems and two short stories by Robert E. Howard, all chilling and oddly compelling—if you have a morbid turn of mind. I don't think I could listen to it a second time, but I enjoyed it the once—and you may be one of the appalling multitude of Lovecrafty horror freaks who get off on ancient terrors and ghastly gods and flayed souls as a steady diet. Me—well, once I smoked opium. I enjoyed it the once.

But if you like Howard, this is prime Howard. The one I liked the best (and would be most likely to enjoy a second time) was a marvelous old Kull of Valusia story called "The Mirrors of Tuzun Thune." It raised the hairs on my neck (until they were old enough to fend for themselves).

All the selections are read by Ugo Toppo (honest), an established pro in the field of spoken word. Frankly I found him just a hair too hammy for my taste (you know, heavy significant pauses before words that aren't all that heavy, stuff like that, a bit too much Shakespearean Shudder in the voice here and there), but I must admit his voice is superb and versatile.

And this one contains a small booklet with complete text.

Prices unknown: write to Alternate World Recordings, 148 East 74th St., New York N.Y. 10021. (Hint to AWR—I'd like to hear the Harlan Ellison.)

* * *

Back to the written word. *The End of the Dreams* is what Harlan is always getting falsely accused of: a 100% recycled product. It comprises three long stories by James Gunn, reprinted from three earlier Gunn collections. According to the foreword, it is companion volume to one released last year, also consisting of reprints from previous Gunn collections, to which these stories are sequels.

But this is *not* a case of filing off the serial numbers and peddling it over the state line, any more than it is when Harlan manages to keep his works in print and available for sale. The collections in question were issued in the 1950s by Bantam, which has no hardcover line, and I for one never saw any of 'em. If reshuffling the stories thematically helps Jim Gunn resell 'em, I say huzzah. The end result was, I got to read them.

And they're dandy stories. Just a hair dated, but they were written when a story was a story, when

dreamers had hope and a "science of happiness" seemed within man's ultimate grasp. "The Immortal" (part of a collection of which the 1970 ABC-TV series *The Immortal* was a botched clone) in particular was vivid and chilling, and "Space Is A Lonely Place" had a splendid ending.

Jim is a past president of SFWA and an Ole Pro and this is some of his vintage stuff, available for the first time in hardcover. Tamam shud.

* * *

I almost didn't read George Alec Effinger's new collection, *Irrational Numbers*. Robert Silverberg's supercilious introduction, asserting that This Probably Isn't What You Wanted To Read But That's *Your* Problem, Jerk nearly convinced me. But I happen to have read some stuff by Piglet that I liked, so I pressed on. And found the book OK.

It comes in some-hazy-where around 65 on the Spider Scale; I frankly admit that part of the time I didn't know what Piglet was talking about and a small part of the time I actively disliked how he was doing it. But many of the stories appealed to me, and "At The Bran Foundry" was hilarious, a delightful, creepy and superbly paced paranoid fantasy about a class field trip through the foundry where they stamp ore into bran flakes. (the Firesign Theatre would have loved it.) The book's out on lend to a fellow Effingerian, and I can't remember the title of the other story I especially liked, a tragicomic masterpiece about a football player who finds that getting skulled on the field gives him incredibly realistic flashbacks of the day his wife died—and endures them, seeks them out, for the vivid glimpses of his wife.

Yes, Effinger is a maverick writer. But don't let that worry you: A.E. Van Vogt was a maverick writer once.

* * *

I'm running so far over that I'm going to have to give minireviews to everything that's left, even though some are excellent and deserve more space. Authors concerned, I'll try to make it up to you. I'll buy you a drink at the next con we're both at.

Oh, and speaking of conventions . . .

Now might be a good time to unload the news that I am either (depending on the new lead-time) going to attend or have attended Watercon, a regional con held Oct. 9 in Waterloo-Kitchener, Ontario, as Guest of Honor. If it's not October by the time you read this, come on up—I don't know what hotel yet but you could phone *Galaxy* or read *Locus*. If it's too late, oy such a shame. I plan to bring my guitar and play Fluid mad-

rigals and say things and maybe even auction off a couple original manuscripts . . .

That's off my mind; so much for planted surprises. On to the minis:

This Darkening Universe—Lloyd Biggle is a writer of enormous potential; his *Monument* was just that. This is more tongue-in-cheek, part of a series about an interstellar private eye, who in this number takes on an Unidentified Death Force (Udef) that sterilizes every planet it touches. Not a great book, but a good read—and I'd like to see the rest of the series. I think what Lloyd needs is to stop churning them out for Doubleday and write the hell out of one. But maybe he did that for years and starved and I never read him—how should I know? Shut up, Spider.

The Unpleasant Profession of Jonathan Hoag—a long-out-of-print collection of some of Heinlein's finest—and most offbeat—work, including the title story (a slambang fantasy), the Grand Classic definitive ultimate time travel story "'All You Zombies," the paralyzingly plausible "They," (about the ultimate paranoid fantasy) and one of my favorite fantasies of all time, "The Man Who Traveled In Elephants," which *still* after twenty years and countless readings elicited literal tears of joy from me again. Another Side of the Master.

The Book of Gordon Dickson—in at least its second printing, a representative selection of a master's

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work in short stories, contains the classic "Danger—Human" and 1966 Nebula-winner "Call Him Lord," (a simply splendid story) plus other good stuff, only excuse for failure to purchase is prior possession.

Connoisseur's Science Fiction—British editor-publisher-reviewer Tom Boardman has assembled a slick, respectable-type Penguin collection—with a startling cover for which the outlandish title must be apology. All great stories, by Bester, Pohl, Sturgeon, Asimov *et al*—but virtually every single one was savagely satiric in theme or execution. My lip got curled into a permanent sneer. Does cynicism make you a connoisseur? Or the other way 'round?

Star Trek: The New Voyages—I am told that the majority of the material in this compendium of stories and articles ranges from good to excellent. Myself, I have a threshold problem: I have become constitutionally (and apparently incurably) incapable of assimilating one more written or spoken word having to do with Captain Bones and Yeoman Spock and Doctor Tribble and the Star Ship *Intercourse* which like a transvestite in a ladies room boldly goes where no man has gone before. If you don't have this condition (called "Atrekia"), enjoy.

Logan's Run—should have been titled "Nolan and Johnson's Runs," a ghastly slapdash skeleton of a book by two men who, from their track record, have no excuse. It's a more-than-hackneyed Race Against Death in your standard-issue Big Brother future, so shallow I couldn't get the soles of my feet wet. About a world of the young, where they kill you when you reach age 21. Honest to God. Soon, it says here, to be a major MGM movie, with Michael York and Peter Ustinov. I flatly predict that said flick will be as piquant as the end result of a lentil dinner with Coca Cola; consequently it and the book get the third or is it fourth Galaxitive Award.

Telempath—I happen to have read this particular book on the close order of 100,000 times, in its prepublication stages. And yet it chanced that when the galleys came across my desk the other day, I hadn't read a word of it in over a year, so I believe I can maintain some objectivity. I read it in a single twelve-hour sitting, totally absorbed in its superb blend of traditional and innovative sf, its magnificent characterization. This man writes with muscle and style. Deserves the Reviewer's Highest Accolade: Just The Way I'd Have Done It Myself.

Next month (Good Lord willin' an' the creek don't rise) a reasonably comprehensive (if not comprehensible) overview of the body of Harlan Ellison's work, an explosion of paperbacks from Ballantine, and surprises. ★

INAUGURAL

it was unanimous.

Barry Malzberg & Bill Pronzini



As of course you know, this is my *first* inauguration—but I certainly hope and pray it will not be my last!

So then, here we are. I, Carole: your new President. You, my billions and billions and billions and billions of friends: needful, trustful, loving. It was not six months ago, as you'll all remember, that I, as commander of the Skipstone, proudly took us all in spirit to the Centauris, hoping that this resuscitation of the long-abandoned space project would give you unity, would weld together everyone on this globe. This had been done even without my efforts; you have found your unity, and you have delivered unto me as your President and with that union the clear high promise of your mandate—

Pardon me. Pardon me for this excess of rhetoric. You must surely understand how emotionally moved I am. You must surely understand my emotions on this difficult and poignant occasion, which does not yet lack the promise of joy. I, Carole: six months ago, the first female commander of a major spatial probe; now, the first female President. I am deeply, *universally* honored—

Again, please, I beg your indulgence.

As I look out upon you, out upon all the spaces of the land, the inferences of the landscape expose themselves to me in all their beautiful, broken, blessed glory. An excess of union—this is what I see and what I feel. One of my predecessors said from approximately this same point many, many years ago that we gather here not for a victory of party but a celebration of freedom. Freedom. It is what we seek and it is what we shall together find—

George, please, this is *my* address. Everyone already knows from your own speech what *you* intend for us; everyone already knows only too well—gratefully—of your loyalties as my second in command on the Centauri drill, and now as my wonderful and devoted Vice-President. What they do not know, but what I was and am still about to tell them, is that you have become my husband.

No tears, George. No tears for any of us. Least of all before our billions and billions and billions and billions of friends. So . . .

So we must humbly and proudly continue. We must all continue. And that is, of course, what I said to you, my dear brethren, near the turnpoint of the Centauri run, as we came to settle into single orbit around that doom-stricken and ruined binary. My dear brethren, I said, no, that is not quite right, George, I said, because naturally it was George I was talking to on the Skipstone and not my dear, dear brethren, George, we must carry on; we must successfully complete this mission not only because all of Earth is counting on us but because in the joyous accomplishment of

this first starflight resides hope for peace.

George, I said, George, in the stars—*salvation*!

You may recall, some of you may recall, that is, you may recall that there were those who laughed. There were those who scorned our great journey. There were those who said that the tachyons were as likely to fail as all the governments, and that if *Skipstone* did not self-destruct, the governments would. Or both. Very difficult for George and myself, as you can imagine. Very difficult.

You have been extremely patient, but I promise I will not keep you much longer. Not much longer. Thank you once more for bearing with me, one and all.

There is no need for that, George. Stop it. Please.

Please.

Oh my friends, my cherished friends, you must be able to see how moved is our darling George. But he got hold of himself in *Skipstone* and he damned well better get hold of himself here and now, please, George.

We have unity. Unity. A perfect unity which swept us by unanimous vote—your unanimous vote and ours—

Unity and Unanimity—

Swept by unanimity just two hours later into the offices of President and Vice-President of this great land; swept me into this inaugural; swept our dear George into tears, into tears; swept both of us into matrimony, matrimony, matrimony. For what we face here—

* * *

George, please. Please, God.

What we face here, charred and empty—

In Babylon there are many gardens—

Gomorrah knew greatness in its time—

But we are, we both are—

No. Not that. We are not that.

My name is *Carole*; yours is George.

Carole and George.

President and Vice-President.

First Lady and First Man . . . ★





DIRECTIONS

Dear Mr. Baen:

While I had foreseen the precipitation of a new military era caused by military lasers, Dr. Pournelle's article, "Lasers, Grasers, and Marxists," pointing out the inherent danger of a total nuclear war during the transition from the pre-laser era came as a shock. That the Soviet Union's leaders could contemplate the loss of 40% of the Soviet Union's population in order to make the world safe for their brand of communism became plausible. It becomes even more plausible when one remembers that the Soviet Union has a number of installations similar to our "nuclear-weapon proof" NORAD combat-operations center under Cheyenne Mountain, thus insuring that the leaders would not be part of the 40% casualty figure.

Even if this scenario is avoided, however, the likelihood of direct confrontations between the Soviet Union and the United States would seem to be made more likely by the advent of airplane- and ICBM-eating lasers. Present 250-kilowatt lasers, which can cut metal and explode plexiglass cockpits are already on the way to relegating aircraft to a purely logistical role. The development of self-critical lasers which would use the nuclear energy produced by a gas-core reactor to make the gas-core itself a laser ("Science News," 5/15/76) and produce, perhaps, a 20-megawatt beam, could easily deal with ICBMs. Even a 10-megawatts/cm^2 causes a metal target to become a plasma which gives off intense X-rays that would foul the electronic devices of any warhead ("L'Utilisation Militaire Des Lasers" by W. D. Metz, "La Recherche," June, 1976).

Once such lasers were deployed, both on land and in satellites (so it's against the SALT I Treaty, treaties have been broken before), the Mother/Fatherlands would be protected. Aggression would no longer lead quickly to a cataclysm for both sides. Warfare would once again become more or less "conventional".

A possible scenario, for example, would be a two-pronged attack launched by the Warsaw Pact against Western Europe. One prong could sweep across the northern German plain toward the Low Countries, while the other prong would be launched through the Fulda Gap. In four days of heavy fighting, these armies might be able to reach the Rhine before troops stationed in the United States could reinforce the Allies. Such an attack would no longer be met with the threat of nuclear annihilation.

Another thing to keep in mind is that although air and space borne delivery of nuclear warheads will have been checkmated, a nuclear bomb would make a dandy land mine, sort of an anti-army rather than anti-tank or personnel weapon. The pendulum of warfare might be swinging back to favor the defense.

Concerning Dr. Pournelle's article of Lovecraftian horror, "In the Beginning" (October, 1975), recalled some musing I have done about Einstein's General Relativity. The very fact that Einstein's General Relativity theory leads to chaos and the possibility that Cthulthu may pop out of a naked singularity might mean that there is something wrong with the theory. Interestingly enough, Hüseyin Yilmaz of the Perception Technology Corporation has pointed out that while General Relativity is consistent with special relativistic first-order Doppler effects, it is inconsistent with second-order Doppler effects which have been established by experiments to a very high order of accuracy. This is another reason to have some doubts about the General Relativity theory. In "New Approach to Relativity and Gravita-

tion" ("Annals of Physics: 81, 1973), Dr. Yilmaz has developed a slightly different relativity theory which predicts correctly all the Newtonian and post-Newtonian effects of gravity and is consistent to the second order. In fact, his theory only diverges from Einstein's in the strong field and weak field limits. The strong field limit does not have a Schwartzchild singularity and Yilmaz's theory does not lead to the usual "black hole" concept for collapsed stars. It leads instead to ultramassive stars which seem to have properties that resemble those of quasars. There are other differences between the two theories that might be tested. If the Yilmaz theory should prove to fit the data better, good-bye black holes and good-bye Cthulthu.

Mr. Varley's "Gotta Sing, Gotta Dance" was one of the more enjoyable stories I have read this year. The idea of a human-plant symbiotic team with the plant providing life-support, computation and company was especially clever, and the description of the energy-intake phase was delightful.

"Larval Stage" by Steven Utley did not make the grade. I can best express my "ennui" with the story by asking the following questions:

1) Who have the mass-minded Cygnians been fighting in order to have developed ships with shields and weapon systems? Weapon systems that amount to anything are not developed without a good stimulus. Surely ten years of more-or-less peaceful contact with the Terran Network could not have provided such a stimulus and surely the mass mind is not schizoid enough to fight itself.

2) Why did the Cygnians first visit Alpha Centauri (A or B?) IV instead of the Earth where the Terran Network Central is located? The visit to Alpha Centauri is even more puzzling when one considers the fact that Alpha Centauri is over a parsec further from the 61 Cygni system than the Earth is.

3) Is there still contact between the individual Cygnians and the mass mind when the two are separated by a distance of 4.31 parsecs? If not, what happens to those Cygnians which are "severed" in this manner?

Keep up the good work with *Galaxy*!

Yours truly,

Jean Alexander Sharland
7024 Hanover Parkway
Greenbelt, MD 20770

Indeed, a shift from offence to defence does seem historically overdue . . . if I were a Soviet commander I would be quite nervous about launching an attack over the German border; those "army-eating landmines" could already be emplaced! As for "Larval Stage," (1) Previous contact between the Cygnians and other species is assumed, (2) Perhaps they thought it discreet to visit an outpost first, and (3) Yes; the Cygniar mass-mind is very powerful—and, besides, it isn't limited to four dimensions!

To the Editor:

There are those of us who can *occasionally* write fine science fiction. Like Kingsley Amis, like Howard Fast, like Myself. I have flashes of that splendid sf insight, but it isn't really built into my psyche. And then there are those whose sf-sense is a part of them like the intelligent symbiotic plant is a part of the protagonist in GOTTA SING, GOTTA DANCE. I'm talking about *born* science fiction writers. Like Heinlein and Tiptree. They naturally think that way. I'm talking about John Varley. Varley is a born science fiction writer.

In GOTTA SING, GOTTA DANCE Varley has fused pop art, mysticism, classical aesthetics, modern aesthetics and pure sensuality with the limitless imagination of the sf visionary. The ideas are well thought out, original, exploratory, and they come one right after the other. I think he's original, which is perhaps a primo quintessence of the Great sf writer, and I think if he doesn't get a Hugo for that goddamn story then I shall lose all respect for the award.

The Nebula committee tends to be more open-minded toward young writers, I think, then the Hugo people. It's time a major sf award went to a younger, innovative writer, and Varley has demonstrated that he is de-

serving.

John Shirley

1110 SE Franklin
Portland, OR 97202

Dear Mr. Baen:

Mr. Geis took a step back from his view of fandom in the May Galaxy to give us two propositions about the human condition: that morality follows the human condition, and that alienation increases as the standard of living decreases. Though these are interesting, I must take issue with them.

Starting with the last, I see no empirical evidence that affluence means more interaction with the enviroment and concern for human existence. One need only look about to see hundreds of thousands, millions of a lienated and dissatisfied people. When our machines make each of us self-sufficient physically and give us the illusion of being emotionally so, what else can happen? The poor person on the other hand must depend upon his family and neighbors for his existence. If he feels alienated, he dies.

The first theorem has, superficially at least, more backing, but there are at least two fairly modern examples of well-to-do peoples who stooped to barbarism. Nazi Germany produced the most technologically advanced industrial complex of its time and raised itself out of the worst depression the world has ever seen, yet was responsible for the rape of Europe and the murder of over four million Jews. Similarly, France had a comparitively high standard of living at the time of the Revolution, despite which there followed mass slaughters of political undesirables in the city squares.

The distinguishing point of both occurrences was that although neither was actively participated in by the mass of the people (Hitler never got an absolute majority of votes), neither were they condemned. Mercier reported the gardens of the Tuileries more luxuriant than ever in the midst of the Revolution. We need not have "the Arena on worldwide 3-D hookup" to have a barbaric society.

One possible explanation of the rise of man is simply social evolution. It is logical that as civilization becomes more advanced, more civilized, it should have found new ways to cope with age old problems. But I don't have the final answer. A gold-leaf autographed copy of *A Study of History* to the person who answers *that*.

Faithfully yours,
Wayne Wolf

2156 Rosarita Drive
Tempe AZ 85281

Dick replies:

Dear Jim:

It would take a great deal of research and time to detail the information that leads me to think that as mankind creates surpluses of useable wealth by "raping the planet" he is able to indulge in the luxury of greater welfare and other social amenities for more and more of the "disadvantaged" (those who are too stupid or emotionally knotted to cope with life's problems successfully).

I thought it was obvious.

At the same time, of course, technology allows us to indulge our xenophobia more efficiently, for less-than-noble reasons. But overall, I think technology has allowed us to improve living conditions, at least in this country.

When have people NOT been alienated and dissatisfied? That is built into us, I suspect—an integral part of the human condition, like having to die.

However, I don't really want to argue with a man who thinks that our machines have made each of us self-sufficient, when in fact technology has made us all more dependent on others for our basic needs. Most of the population used to be about 90% self-sufficient, on farms. Now we are all specialists and dependent on other specialists for everything. It is not only the poor person who must depend on others for life. It is just that for the others the dependency and vulnerability is masked and ignored and has other labels.

Now, if you'll excuse me, I must tend my garden, feed the chicks, make a pair of shoes

and cut some wood for the stove. . . .while on the treadmill which runs the generator.

Best,
REG

Dear Mr. Baen,

How could you do it? Alter finally manages to gain control for just one column and you let Geis back in the command chair, that's unethical, inhumane, cruel and antisocial. Anyone with a rudimentary intelligence can see that Alter is the greatest statesman of this century, and by keeping him locked up in the archives you and Geis are immeasurably slowing down the progress of this great nation. What would the world be like today if some deformed entity like Geis had locked up Plato, or Cicero, or Locke, or Gandhi, or Marx; well, maybe they should have locked that one up. Why, if Alter were freed he could become an author or publisher, even an editor! Now don't get your androsterone up James, I'm sure Alter would find a job for you somewhere, maybe in circulation. If Alter were freed he could even become President, think of it, the country would finally be led by somebody without a perversion about tape-recorders or a Boston accent. We must free Alter! We must put him in control and let Geis live in the dungeon for a while. We must form a Freedom for Alter Society, if the fans out there are interested all they need do is write. Join today, for Alter, for Freedom and Democracy, for America!!

Sincerely,
Charles Vane

713 Tulane Dr. NE,
Albuquerque, NM 87106

Dick, I think we're in trouble . . .

Galaxy

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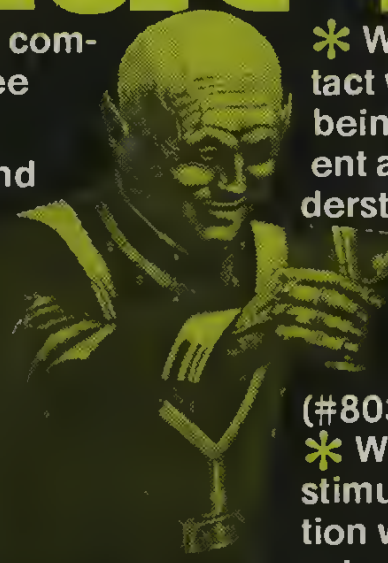
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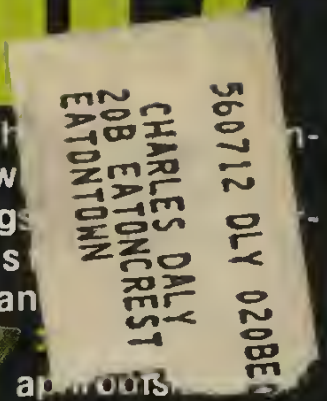
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